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DRIVERS OF MATERNAL FOOD CHOICES FOR CHILDREN UNDER 5 YEARS IN AKUAPIM NORTH DISTRICT, EASTERN REGION, GHANA

BY

AKORFA AFENYO

10308004

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DECLARATION

I hereby declare that with the exception of references to other people's work which have been duly acknowledged, this dissertation is my work and has not been submitted elsewhere for the award of any university degree.

…….. ……

AKORFA AFENYO DATE

(STUDENT)

…….. ……

DR. AMOS LAAR DATE

(SUPERVISOR)

DEDICATION

I dedicate this work to my family and friends for their immense support throughout my study period.

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I am grateful to the Almighty God without whom I could never have completed this work. My appreciation goes to my supervisor, Dr. Amos Laar for his guidance throughout this project. I am also thankful to the Nutrition Officer of the Akuapim North District for her immense support and guidance. My gratitude goes to all staff of Mangoase health centre, Tinkong CHPS, Adukrom health centre and Mampong CHPS for their help during my data collection. Final thanks go to all mothers and their children who participated in this study.

God richly bless you all.

ABSTRACT

Background: Good nutrition in the early years of life is very crucial for the growth and development of children. Most of the eating and health behaviours developed in the early years of life are likely to persist into adulthood. Food choice is a complex behaviour that is influenced by multiple factors such as environmental, personal and biological factors. Parents, particularly mothers have powerful influence over children's early food experiences. However, no systematic research has been done on the drivers of maternal food choices for children under 5 years in the Akuapim North District. This study therefore aimed to find out what drives mothers' food choices for their children.

Methods: A community-based study was done using focus group discussions and quantitative survey. The study was conducted in the Akuapim North District in the Eastern Region of Ghana. Mothers and their children under 5 years constituted the study population. Quantitative data was collected using a questionnaire and analyzed using SPSS version 20. Bivariate analysis and logistic regression was used to find associations between outcome and predictor variables. Qualitative data was transcribed verbatim and analyzed manually.

Results: Among children aged 0-5 months 67.1% were exclusively breastfed and 78.9 % of children aged 6-59 months were fed from at least four food groups. Exclusive breastfeeding was associated with employment status (aOR = 1.378; 95% CI, 0.125-15.193) and educational level (OR = 1.861; 95% CI, 1.040-3.330). Feeding from at least four food groups was associated with family influence (aOR = 0.612; 95% CI, 0.282-1.330), belief to be good for children (aOR = 0.538; 95% CI, 0.232-1.250), staple food preference (aOR = 0.587; 95% CI, 0.276-1.247), availability (aOR = 0.856; 95% CI, 0.399-1.835) and value for money (aOR = 0.648; 95% CI, 0.317-1.324). This study revealed that associations existed between feeding from at least four food groups and

nutritional value (aOR = 0.094; 95% CI, 0.009-0.971) and smell (aOR = 0.377; 95% CI, 0.197-0.723). Children who were fed from less than four food groups were 3 times more likely to be stunted compared to children fed from at least four food groups (OR = 3.147; 95% CI, 1.652-5.995).

Conclusions: The study found educational level and employment status, mother's recommendation, food belief to be good for children, staple food preference, availability, value for money, nutritional value, and smell as factors associated with maternal food choice for children under 5 years.

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BF	Breastfeeding
CHPS	Community-based Health and Planning Services
CI	Confidence Interval
DHMT	District Health Management Team
EBF	Exclusive Breastfeeding
FGDs	Focus Group Discussions
GDHS	Ghana Demographic and Health Survey
GSS	Ghana Statistical Service
HAZ	Height-for-Age Z score
IYCF	Infant and Young Child Feeding
MICS	Multiple Indicator Cluster Survey
NMES	Non-milk Extrinsic Sugars
SES	Socio-economic Status
TV	Television
UK	United Kingdom
UNICEF	United Nations Children's Fund
US	United States of America
WAZ	Weight-for-Age Z score

WHZ	Weight-for-Height Z score
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Nutrition in the early years of life is essential for the growth and development of children and influences health outcomes later in life (WHO, 2003). Health problems associated with poor diets in early childhood include undernutrition, obesity, anaemia and dental caries (Abdollahi, Kianfar, Abtahi, & Amini, 2011; Hayter et al., 2015).

Generally, there has been a global decline in malnutrition. Despite this decline, Africa has seen an increase in childhood malnutrition over the past decade (Black et al., 2011). In 2011, stunting affected at least 165 million children under 5 years and wasting affected at least 52 million children under 5 years (Black et al., 2011). In developing countries, about 39% of children under 5 years are malnourished and about 54% of cases of under-5 mortality is as a result of malnutrition (Van de Poel, Hosseinpoor, Jehu-Appiah, Vega, & Speybroeck, 2007). In Sub-Saharan Africa, the prevalence of malnutrition in children under 5 years is 41% (Van de Poel et al., 2007). In Ghana, among children under age 5, 19% are stunted, 5% are wasted, and 11% were underweight (GSS et al., 2015). About 54% of all deaths recorded in early infancy in Ghana are attributable to malnutrition, making malnutrition the major cause of child mortality (Van de Poel et al., 2007).

The diet of many children worldwide, particularly those in socially disadvantaged groups, is unsatisfactory and does not meet the recommended dietary requirements (Alderson & Ogden, 1999). For instance, children from lower income families tend to consume less fruit and vegetables and take in more non-milk extrinsic sugars (NMES) (Nelson, Erens, Bates, Church, Boshier, 2007). Data available from the National Diet and Nutrition Surveys showed that children aged 1.5 to 3 years were not meeting the recommended minimum amounts of fruit and vegetables and

exceeding the recommended amount of NMES (Bates, Lennox, Prentice, Bates, Swan, 2012). Only 13% of children age 6-23 months in Ghana meet the minimum standards set by three core infant and young child feeding (IYCF) practices (GSS et al., 2015). Such poor diets in children is an issue of concern owing to the increasing evidence that a person's diet has influence on their health (St John Alderson & Ogden, 1999).

Research has shown that health in adulthood is affected by nutrition in childhood. There is also evidence to show that dietary habits acquired in childhood persist into adulthood (Fisk, Crozier, Inskip, Godfrey, & Cooper, 2011). Nutrition in children is important in terms of child health as well as health later in life. Development of food choices, however, is a complex process and not well understood (French, Story, Harman, Breitlow, Jeffery, 1999). Research has identified the role of peer influence and television commercials in food choice. In particular, there is substantial evidence that parental influence is important in the development of children's dietary behaviour. Children spend their early years learning and developing eating habits. Parents are responsible for the eating habits of children as they create the food environment in which children are raised. Childhood food patterns are influenced by parental preferences and beliefs, role modelling and media exposure (Hayter et al., 2015; Alderson & Ogden, 1999).

Parents affect children through the foods purchased and served in the household thereby influencing children's eating habits and food preferences. There is also evidence to show that mothers' motivations affect the foods they feed their children. Therefore, parents, particularly mothers, influence the eating habits of children which in turn affects children's nutritional status. Since mothers have a great influence over children's early food experiences, it is imperative to understand what drives mothers' food choices for their children.

A number of studies have looked at parental food choices for children and have identified different factors that influence food choice; these include cost of food, access to food, social factors, cognitive factors and psychological factors (Chaidez, Townsend, & Kaiser, 2011; Hayter et al., 2015; Ohly, Pealing, Hayter, Watt, & Rees, 2012). Steptoe, Pollard, & Wardle, (1995) identified health, convenience and familiarity as cognitive factors that affect food choice. Price has also been stated as one of the greatest motivating factors in food choice, with 'healthy' foods frequently considered as expensive (Hildebrand & Shriver, 2010).

The aim of this study was to examine the different factors that determine mothers' food choice for their children. Further, the study aimed to assess whether mothers' food choices for their children influenced the nutritional status of children.

1.2 PROBLEM STATEMENT

Nutrition is essential for optimum child development throughout the years of life and beyond. Poor nutrition poses a risk for impaired physical and mental development of children, obesity, diabetes and other non-communicable diseases in adulthood (Black et al., 2011). Stunted, underweight, and wasted children have an increased risk of death from diarrhoea, pneumonia, measles, and other infectious diseases (Black et al., 2011). Despite a number of initiatives and interventions to address the problem of malnutrition, there still remains a lot to be done in Ghana. WHO recommends exclusive breastfeeding for the first six months, continued breastfeeding for two years or more, safe, appropriate and adequate complementary foods beginning at 6 months; and frequency of complementary feeding: 2 times per day for 6-8 month olds; 3 times per day for 9-11 month olds (Black, Allen, Bhutta, Caulfield, de Onis, 2008b). However, only 46% of Ghanaian children aged less than six months are exclusively breastfed, a level considerably lower than that recommended by the WHO/UNICEF (Black, Allen, Bhutta, Caulfield, de Onis, 2008b). Among children under 5

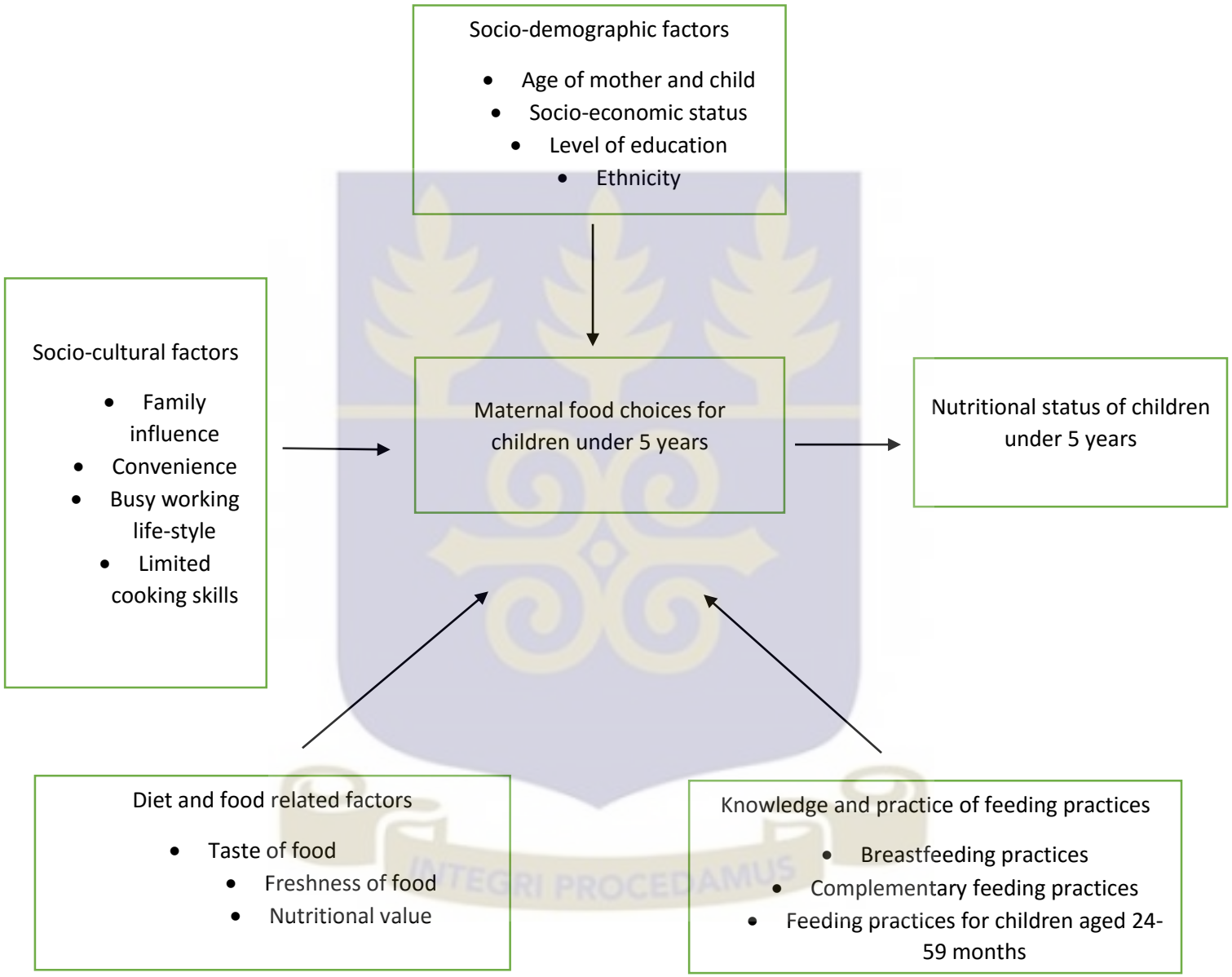
years, 19% are stunted, 5% are wasted, 11% are underweight and about 3% are overweight in Ghana (GSS et al., 2015). According to the GDHS, 17% of children under 5 years in the Eastern Region are stunted, 3.2% are wasted and 7.9% are underweight (GSS et al., 2015). Also, only 4% of children living in the eastern region receive the minimum acceptable diet for complementary feeding (GSS et al., 2015). A study done in the Akuapim North District reported a prevalence of 6.2%, 11.4% and 7.3% for wasting, stunting and underweight respectively among children under 5 years. According to the study, only 51.8% of children are exclusively breastfeed for the first six months of life in the Akuapim North District (Anderson, Bignell, Winful, Soy, & Steiner-Asiedu, 2010). In 2014, some programmes such as routine vitamin A supplementation, health education on breastfeeding and complementary feeding and growth monitoring were implemented to improve child nutrition in the Akuapim North District. However the proportion of children under 5 years who are underweight increased from 2% in 2013 to 3.1% in 2014. The consequences of malnutrition in infants and young children are detrimental, causing impairment in physical growth and neurological development, lower intelligence quotient and increased susceptibility to disease and mortality (Aheto, Keegan, Taylor, & Diggle, 2015). In Ghana, malnutrition accounts for around 40% of deaths in under-fives (Aheto, Keegan, Taylor, & Diggle, 2015). Only 13 percent of children age 6-23 months in Ghana meet the minimum standards set by three core infant and young child feeding (IYCF) practices (GSS et al., 2015), a level still below the WHO-recommended standard of 90% coverage (Issaka et al., 2015). Mothers do not have adequate knowledge about appropriate feeding practices for their children (Oche, Umar, & Ahmed, 2011). Also, mothers make decisions regarding food for their children based on factors such as cost and convenience rather than health benefits and nutritional value (Hayter et al., 2015). Food choices particularly in low and middle income countries like Ghana, is further complicated by issues of

poverty and food availability. No systematic research has been done on the drivers of maternal food choices for children under 5 years in the Akuapim North District.

In summary, research indicates the role of maternal influence on children's diet. However, the factors that drive food selection for children remain unclear. In Ghana, little literature is available on the various factors associated with food choice for children. Understanding how mothers make decisions on feeding their young child is important in determining the type of interventional support to be developed to promote good nutrition among children.

1.3 CONCEPTUAL FRAMEWORK

Figure 1: Conceptual framework for drivers of maternal food choices for children under 5 years.



Source: Investigator (based on literature)

Maternal food choices for children under 5 years can be influenced by socio-demographic factors, socio-cultural factors, media, diet and health related factors and knowledge and practice of feeding practices (Abdollahi et al., 2011; Holsten, Deatrick, Kumanyika, Pinto-martin, &

Compher, 2012; Neumark-sztainer et al., 2012; van Ansem, Schrijvers, Rodenburg, & van de Mheen, 2014; Vereecken et al., 2011). A number of studies report that socio-demographic factors such as maternal educational level, ethnicity and employment status can impact food choices (Bauer et al., 2012; Cribb, Jones, Rogers, Ness, & Emmett, 2011; Neumark-sztainer et al., 2012; van Ansem et al., 2014). Cribb et al., (2011) found low maternal educational level to be associated with less healthy food choices. Ethnicity has also been found to influence food choices (Neumark-sztainer et al., 2012). Mothers are more likely to buy and prepare foods that are less stressful and less time consuming to prepare and buy (Hayter et al., 2015). The ability to cook also determines what foods mothers cook at home (Hayter et al., 2015). Other social factors such as high work–life stress, depressive symptoms, high food purchasing barriers and fewer hours in food preparation have also been associated with food choice (Neumark-sztainer et al., 2012). Diet and health related factors such as quality, freshness, taste and healthiness of food have been shown to be important factors in making food choices (Ohly et al., 2012). Maternal food choices for children affects the nutritional status of the children (Ezzati, Lopez, 2002).

1.4 JUSTIFICATION OF STUDY

Nutrition in the early years of life is very important for child growth and development (WHO, 2003). Malnutrition is a major contributor to mortality and morbidity in children under 5 years (Black, Allen, Bhutta, Caulfield, de Onis, 2008a). This study is being conducted to find out the factors that drive maternal food choices for children under 5 years and how these food choices affect the nutritional status of these children. A study by Abdollahi et al. (2011) suggested that food choices for children under 5 years could have negative implications on their health and development. Inadequate complementary feeding practices have also been shown to have detrimental effects on the health and growth of children particularly in the first 2 years of life

(Kabir, Khanam, 2012). Breastfeeding initiation within 24 hours of birth and exclusive breastfeeding are associated with a 44–45% neonatal mortality (Bhutta et al., 2013). The GDHS report for 2014 shows that the prevalence of exclusive breastfeeding and appropriate complementary feeding is below the WHO recommended coverage (GSS et al., 2015). Mothers do not have adequate knowledge about appropriate feeding practices for their children (Oche, Umar, & Ahmed, 2011). Also, mothers make decisions regarding food for their children based on factors such as cost and convenience rather than health benefits and nutritional value (Hayter et al., 2015). There is a need to understand what drives mothers' food choices for their children to be able to develop interventions that can improve the nutritional status of children, taking into consideration factors that are most important to mothers when choosing food for their children as well as the challenge of limited food availability and diversity. Improving nutrition in children is a major step to reducing child mortality since malnutrition accounts for around 40% of deaths in children under 5 years in Ghana (Macro, 2005). This study will provide relevant information that will serve as a guide for the development of more effective nutrition-sensitive programmes and inform evaluation of the impact of these programs on nutrition outcomes.

1.5 GENERAL OBJECTIVE OF STUDY

To determine factors that influence maternal food choices for children under 5 years.

1.6 SPECIFIC OBJECTIVES OF STUDY

- To determine socio-demographic factors that influence maternal food choices for children under 5
- To determine socio-cultural factors that influence maternal food choices for children under 5

- To determine diet and health related factors that affect maternal food choice for children under 5
- To assess knowledge and practice of appropriate feeding practices among mothers of children under 5 years
- To determine associations between nutritional status of children under 5 years and maternal food choices

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter deals with relevant literature that were reviewed on the study area. The literature review covers malnutrition in children under 5 years, feeding practices among children under 5 years and factors that influence food choice.

2.2 Malnutrition in under 5 years

Malnutrition in children under 5 years encompasses undernutrition and overweight which are a global problem contributing to under-5 mortality and morbidity (Black et al., 2011). Malnutrition is currently the leading cause of the global burden of disease (Ezzati, Lopez, 2002) and has been identified as the underlying factor in about 50% of under-5 mortality cases in developing countries (Black, 2003). Child undernutrition includes stunting, wasting, suboptimal breastfeeding and inadequacies of essential nutrients (Black et al., 2011). Most low and middle income countries are said to suffer a double burden of malnutrition with includes continuous child stunting together with obesity (Black et al., 2011).

Child malnutrition is usually measured using three anthropometric indices of stunting, wasting and underweight. A child is considered stunted if their height-for-age is more than two standard deviations below the median of an international reference population. Stunting indicates chronic nutrient deficiency, and it could impair cognitive and physical development in children with its effects being usually permanent. A child is said to be wasted if their weight-for-height is more than two standard deviations below the median of the international reference population. Wasting is an indicator of acute undernutrition, and it could result in mortality. Underweight is a combined measure of both chronic and acute undernutrition (Arnold, Nangia, Kapila, 2003).

2.3 Epidemiology of malnutrition in children under 5 years

In 2011, stunting affected at least 165 million children under 5 years and wasting affected at least 52 million children under 5 years (Black et al., 2011). East and West Africa, and South-central Asia have the highest prevalence estimates in malnutrition with 42% (East Africa) and 36% (West Africa and South-central Asia) (Black et al., 2011). Despite the fact that child stunting and wasting has seen a global reduction trend, Africa has observed an increase in stunting over the past decade (Black et al., 2011). Among children under 5 years in Sub-Saharan Africa, 38% are reported to be stunted and 28% are underweight (UNICEF, 2005). In Ghana, out of the 2083 children considered in a study, 588 (28%), 276 (13%), and 176 (8%) were moderately stunted, moderately underweight, and moderately wasted, respectively, based on the WHO classification (Aheto et al., 2015). The GDHS reports that among children under age 5, 19% are stunted, 5% are wasted, and 11% were underweight (GSS et al., 2015). According to MICS 4, 13% of children under age five in Ghana are moderately or severely underweight and 3% are classified as severely underweight, 23% are moderately or severely stunted, 7 % are severely stunted, 6% are moderately or severely wasted and 1% are severely wasted (Black, Allen, Bhutta, Caulfield, de Onis, 2008b).

2.4 Consequences of malnutrition in children under 5 years.

Malnutrition in children has negative implications on the growth and development of children, some of which persist even in adulthood. Some longitudinal studies reported that adolescents who were stunted by age 2 years had higher levels of depression and anxiety and lower self-esteem in comparison with those whose were non-stunted (Aheto et al., 2015). Malnutrition in children also contributes largely to under-5 mortality. Globally, about 30% of deaths among under-five children are as a result of malnutrition (Black, Allen, Bhutta, Caulfield, de Onis, 2008). In developing countries, about 50% of mortalities in children under 5 years are associated with malnutrition

(WHO, 2005). In Ghana, malnutrition accounts for around 40% of deaths in children under 5 years (ORC Macro, 2005).

2.5 Malnutrition in Ghana

Ghana is still one of the countries where malnutrition among children continues to be a public health issue. Despite developing into a country with middle income status, there are still areas in Ghana where there is extreme poverty and food insecurity. Most of these poor and food insecure areas are largely in the rural parts of Ghana, where this problem is further compounded by lack of access to quality health care. There is a huge disparity between the living conditions of those living in rural Ghana and people living in the urban centres. Hence, many of the intervention programmes target rural and deprived communities. These interventions aim at improving the health and nutritional status of children under 5 years (ICF Macro, 2010). The GDHS 2015 estimates of the prevalence of stunting showed that, the urban rate was 15% while the rural rate was 22%; the region with the lowest rate was Greater Accra with 10% while the Northern region had the highest rate of 33%, more than three-fold difference (GSS, 2015).

Between the period of 2003 and 2014, data from the GDHS surveys show a downward trend and reveal that all three nutritional status indicators have improved in the last decade. The proportion of stunted children has declined steadily from 35% in 2003 to 19% in 2014. The proportion of wasted children has decreased from 8% in 2003 and 9% in 2008, to 5% in 2014. The proportion of underweight children has decreased from 18% in 2003 to the present level of 11% (GSS), 2015). This notwithstanding, malnutrition is still a major problem in Ghana because, it accounts for as much as 40% of deaths in under-5s (ORC Macro, 2005) and thus tackling this problem would be a great move to reducing under-5 mortality.

2.6 Nutrition interventions

Childhood malnutrition has become an issue of growing interest and initiatives to prevent it has become topmost priority for most counties. Interventions typically focus on promoting proper feeding practices, improving maternal health, and providing access to adequate sanitary conditions. Among some specific initiatives to improve child health and nutrition are three of the eight Millennium Development Goals focused on reducing hunger and child mortality and improving maternal health, and the World Health Organization and United Nations Children's Fund's (UNICEF) Global Strategy on Infant and Young Child Feeding, a programme focused on improving the health, growth and development of infants and young children (Ross, Shanoyan, & Zereyesus, 2014). In Ghana, a number of interventions have been recommended to improve nutrition in children under 5 years. One such intervention is promotion of breastfeeding. WHO recommends initiation of breastfeeding within one hour of birth, exclusive breastfeeding of infants till 6 months of age, and continued breastfeeding until 2 years of age or older. Another intervention is promotion of dietary diversity and appropriate complementary feeding. The Ghana national IYCF strategy promotes exclusive breastfeeding through age 6 months and, thereafter, the introduction of semi-solid or solid foods along with continued breast milk until the child is at least two years old (GSS, 2011).Vitamin A and zinc supplementation are other interventions that have been recommended to promote infant and child nutrition. Vitamin A supplementation has been shown to reduce child mortality. A review of 43 randomised trials showed that vitamin A supplementation reduced mortality in children between the ages of 6–59 months by 24% (Bhutta et al., 2013). These initiatives along with many others are aimed at addressing the problem of child malnutrition, which will not only improve children's well-being in a short-term, but also will promote human development to enhance economic growth.

2.7 Breastfeeding practices

WHO currently recommends that babies should be put on the breast within 1 hour after birth, be exclusively breastfed for the first 6 months, and for an additional 18 months or longer. The risks of increased mortality and morbidity due to inadequate breastfeeding practices are enormous. Sub-optimal breastfeeding practices accounts for more than 800,000 deaths in children annually (Black et al., 2011). Globally about half of children younger than 1 month, and three in every ten children aged 1–5 months are exclusively breastfed. Although there is evidence to prove the life-saving benefits of exclusive breast-feeding up to 6 months, only 30% of children under 6 months of age in Sub-Saharan Africa are exclusively breast-fed (UNICEF, 2005). In Ghana, only 52% of children younger than 6 months are exclusively breastfed (GSS et al., 2015).

Globally, the prevalence of EBF increased in most regions of the developing world, with a major improvement seen in West and Central Africa where the prevalence doubled from 12% to 28%, while slight improvements were observed in South Asia where prevalence increased from 40% in 1995 to 45% in 2010 (*Countdown to 2015. Maternal, Newborn and Child Survival: The 2012 Report*, 2012). However, in Ghana, there has been a national decreasing trend in exclusive breastfeeding and increasing trend in bottle feeding. Data from the Ghana Demographic and Health Survey (GDHS) shows that the percentage of children 0-5 months who are exclusively breastfed has decreased by 17% between 2008 and 2014. The percentages of young children who are bottle fed appeared to have increased from 12% in 2008 to 16% in 2014 (GSS et al., 2015). This trend is worrying and hence, demands large-scale interventions to increase EBF prevalence.

2.7.1 Determinants of breastfeeding practices

Several studies have found a number of factors affecting optimal breastfeeding practices. These studies identified individual factors (example: sex of the baby, work, maternal age and family

pressures)(Agho, Dibley, Odiase, Ogbonmwan, Sunday, 2011; Ogbo, Agho, & Page, 2015; Setegn et al., 2012), health service factors (such as antenatal visits, delivery at the government hospital and mode of delivery) (Ekure, Antia-Obong, Udo, Edet, 2003; Yahya, Adebayo, 2003), and household wealth and geopolitical differences (Agho, Dibley, Odiase, Ogbonmwan, Sunday, 2011) as factors associated with breastfeeding. A study done in Nigeria to identify the determinants of sub-optimal breastfeeding practices found that educated mothers, older mothers and mothers with wealthier households exclusively breastfed their babies. The risk of bottle feeding was higher in educated mothers and women from wealthier households (Ogbo, Agho, & Page, 2015). Another study found lack of knowledge and confidence as the main reasons mothers breastfed for less than the optimum breastfeeding duration (Chezem, Friesen, Boettcher, 2003; Thulier, Mercer, 2009). Perception of insufficient milk and work outside the home were cited as common reasons for premature weaning or not breastfeeding exclusively (Bunik, Shobe, O'Connor, Beaty, Langendoerfer, Crane, 2010). Another study conducted in Ethiopia found employment status as a factor associated with breastfeeding. Employed mothers were found to be less likely to practice exclusive breastfeeding (Setegn et al., 2012). Based on these findings, there is a need for an inclusive assessment of the determinants of breastfeeding practices to inform the development of policies and programmes to improve breastfeeding practices in Ghana.

2.7.2 Benefits of breastfeeding

Promotion of exclusive breast-feeding is rated the most effective intervention for reducing mortality in children under 5 years (Jones, 2003). Some studies investigated the association between early breastfeeding initiation (within 24 hours) and neonatal mortality. Early initiation was associated with lower neonatal mortality in babies who were exclusively breastfed. Exclusive breastfeeding has also been shown to reduce the risk of obesity by 12%. Breastfeeding initiation

within 24 hours of birth and exclusive breastfeeding are associated with a 44–45% reduction in neonatal mortality (Bhutta et al., 2013).

EBF has also been shown to have protective effects against gastrointestinal infections. There is evidence to show that there is a 165% increase in diarrhoea incidence in 0-5 month old infants and a 32% increase in 6-11 month old infants who were not breastfed (Lamberti, Fischer, Noiman, Victora, Black, 2011). Breastfeeding also stimulates an infant's immune response to vaccination and improves cognitive functioning of children (Anderson, Johnstone, Remley, 1999; Dorea, 2009).

Continued breastfeeding beyond six months, together with sufficient nutritionally adequate, safe and appropriate complementary feeding, also ensures good nutritional status and protects infants against diseases. Annually, an estimated 1.4 million deaths in children under 5 years could be prevented by optimal breastfeeding practices in the developing world (Black, Allen, Bhutta, Caulfield, de Onis, Ezzati, Mathers, 2008).

Despite the enormous benefits of breastfeeding, prevalence of EBF still remains low in Ghana. There is a need to employ appropriate interventions to promote EBF among women.

2.7.3 Interventions to promote exclusive breastfeeding

A number of strategies and interventions have been adopted to improve breastfeeding rates globally. Strategies that have been successful in increasing breastfeeding rates are the Baby Friendly Hospital Initiative (BFHI) (Kramer, Chalmers, Hodnett, Sevkovskaya, Dzikovich, Shapiro, 2001), and the use of peer counselors (Haider, Ashworth, Kabir, Huttly, 2000; Morrow, Guerrero, Shults, Calva, Lutter, Bravo, 1991). In developing countries, interventions such as the Integrated Management of Childhood Illness (IMCI) programme in developing countries have

been initiated to improve feeding practices and child growth. (Santos, Victora, Martines, Gonçalves, Gigante, Valle, 2001). Other strategies that have been adopted to increase education include mother-to-mother support and contact with lay counselors or trained personnel via home visits (Anderson, Damio, Young, Chapman, Perez-Escamilla, 2005) or telephone-based support (Bunik, Shobe, O'Connor, Beaty, Langendoerfer, Crane, 2010).

Several reviews have been done to assess the impact of breastfeeding interventions. A review by Chapman, Morel, Anderson, Damio, Perez-Escamilla (2010) found that peer counseling effectively improved early breastfeeding initiation, breastfeeding duration and exclusive breastfeeding. A recent Cochrane review by Lumbiganon, Martis, Laopaiboon, Festin, Ho, Hakimi (2012) found that peer counseling, lactation consultation and formal BF education during pregnancy increased BF duration. An intervention study conducted in Ghana aimed at assessing the effect of lactation counselling on exclusive breastfeeding rates among Ghanaian mothers found that there was a 100% increase in exclusive breastfeeding rates among mothers who received exclusive breastfeeding support compared with the control group that only received health education information without breastfeeding support (Aidam, Perez-Escamilla, 2005).

2.8 Complementary feeding practices

Complementary feeding for infants refers to the timely introduction of foods which are safe and of high nutritional value in addition to breastfeeding typically from 6 to 23 months of age (Bhutta et al., 2013). Adequate complementary feeding of children from 6 months to two years of age is particularly important for growth and development and the prevention of under-nutrition (GSS, 2011). Children are likely to become stunted if sufficient quantities of quality complementary foods are not provided even if they receive optimum breastfeeding (Black, Allen, 2008). There is evidence to show that promotion of appropriate complementary feeding practices reduces the

incidence of childhood stunting (Black et al., 2011). A survey examining WHO infant and young child feeding indicators in low-income countries showed that eating foods with dietary diversity reduced the risk of both stunting and underweight while minimum meal frequency was associated with a reduced risk of being underweight (Bhutta et al., 2013).

Complementary foods are usually watery cereal porridges which are low in nutritional value and they are sometimes prepared and stored under unhygienic conditions, making children prone to infections (Gibson, Ferguson, 1998). WHO recommends that for breastfed children, two or more meals of solid, semi-solid or soft foods are needed if they are six to eight months old, and three or more meals if they are aged 9-23 months of age. For children aged 6-23 months and older who are not breastfed, four or more meals of solid, semi-solid or soft foods or milk feeds are needed (GSS, 2011). In Ghana, only 13% of children age 6-23 months meet the minimum standards set by three core infant and young child feeding (IYCF) practices (GSS et al., 2015). A study done in Ghana on complementary feeding practices found that the proportion of children aged 6–23 months who met the minimum meal frequency and dietary diversity for breastfed and non-breastfed children was 46·0% and 51·4% respectively and only 29.9% of breastfeed children were given an appropriate diet (Issaka, Agho, Burns, Page, & Dibley, 2015)

2.9 Dietary practices in pre-school age children

Pre-school age children are shown to require higher amounts of micronutrients as compared to their energy requirements. This age group is particularly at risk for the development of obesity and micronutrient deficiency due to the high levels of saturated fat and sugar and low amounts of dietary fiber in their diet (Butte et al., 2010; Fox, Condon, Briefel, Reidy, & Deming, 2010). It has been demonstrated that pre-schoolers prefer high energy dense foods, mainly due to the positive physiological consequences that they provide in relation to satiety and energy input (Birch, 1998).

Fisk et al. (2011) defined a 'prudent' diet pattern for children aged 24-59 months as a diet high in fruit, vegetables and wholemeal bread, but low in white bread, confectionery, chips and roast potatoes. This is consistent with the principles of the Dietary Guidelines for Americans (DGAs), which encourage a balanced energy intake; increased consumption of low-fat dairy products, vegetables, fruits, and whole grains; and reduced consumption of fruit juice, sugar-sweetened beverages, and foods high in sodium for pre-school age children (US Departments of Health and Human Services and Agriculture, 2005).

Recent data available for children aged 1.5 to 3 years from the National Diet and Nutrition Surveys in the UK showed that children in this age group were not meeting the recommended minimum amounts of fruit and vegetables and exceeding the recommended amount of Non-milk Extrinsic Sugars (NMES) (Bates, Lennox, Prentice, Bates, Swan, 2012). A study that examined the diet patterns of pre-school age children found that among children aged 24–59 months, only 40.6 percent had met "minimum dietary diversity" (had adequate dietary diversity with ≥ 4 food groups). The most frequent food types given to these children were cereals, roots, or tubers followed by vitamin A rich fruits and vegetables, and other fruits or vegetables (*Timor-Leste Food and Nutrition Survey 2013: Summary of Key Findings and Recommendations*, 2015). A study done to describe the food consumption patterns of US children aged 2 and 3 years found that about a third of 2-year-olds and a quarter of 3-year-olds consumed whole milk at least once in a day and about 70% of 2 and 3-year-olds consumed vegetables as a distinct food item at least once in a day while almost 73% of them consumed fruit as a distinct food item at least once in a day (Fox et al., 2010). Another study found that 44% of lower SES pre-school age children are not meeting the recommended daily intake for calcium (Nitzan-Kaluski et al. 2001). A study by

Valmórbida & Vitolo, (2014) recorded a high number of pre-schoolers who consumed less than one daily serving of fruit and vegetables.

An issue of concern is the fact that a large proportion of young preschoolers consume low-nutrient, energy-dense beverages, desserts, and snack foods. Fox et al. (2010) found that about 85% of children aged 2-3 years consumed some type of sweetened beverage, dessert, sweet, or salty snack in a day. Similar patterns were recorded by Piernas and Popkin (2010) who found that snacking had increased among children aged 2-6 years over the past decade. Butte et al. (2010) also documented that saturated fat intakes exceeded recommendations for the majority of preschoolers. These dietary patterns are associated with increased risk of chronic disease, including cardiovascular disease, type 2 diabetes, hypertension, and certain cancers (*Healthy People 2010: Understanding and Improving Health*, 2000; US Departments of Health and Human Services and Agriculture, 2005).

Understanding the food patterns of pre-school age children is important for improving their eating environments and for developing interventions targeted at ensuring healthy eating habits. A few studies have sought to identify factors influencing eating habits of pre-schoolers. A study done to evaluate factors associated with low consumption of fruits and vegetables among pre-schoolers found family income higher than four minimum wages, ($p = 0.024$), lower paternal educational level ($p = 0.03$), and lower fruit consumption at 12-16 months ($p = 0.002$) to be negatively associated with fruit consumption and low paternal educational level ($p = 0.033$) and consumption of high-sugar content beverages at 12-16 months ($p = 0.014$) to be negatively associated with the consumption of vegetables (Valmórbida & Vitolo, 2014).

2.10 Factors that influence food choice

Food choice is a complex behaviour that is influenced by multiple factors such as environmental, personal and biological factors (Abdollahi et al., 2011). A number of studies have explored factors that influence food choices (Abdollahi et al., 2011; Hayter et al., 2015; Vereecken et al., 2011). A study done among North American adolescents found hunger, taste, time and convenience as the strongest factors influencing adolescents' food choices (Vereecken et al., 2011). Another study on breakfast choices among adolescents identified hunger, taste, health concerns and parents or guardian as the most influential factors in the selection of foods for breakfast (Vereecken et al., 2011). Focus groups with children and adolescents found a large number of factors that influence food choices including: taste, availability of foods at home, hunger, food cravings, health benefits, time and effort of food preparation and consumption, cost, advertising, parent support, peer support/approval, body image, and mood (Holsten et al., 2012). A study conducted in Iran to identify factors influencing children's food choices found taste and parents, factors such as TV advertisements, peers, other family member and school staff as important factors that influenced food patterns (Abdollahi et al., 2011). Another study to identify predictors for the consumption of convenience foods found age, concern about naturalness, nutrition knowledge and cooking skills to be strong predictors (Brunner, van der Horst, & Siegrist, 2010). Other factors such as employment status and work-life stress have also been found to influence food choice. A study done to find associations between parental employment and work-family stress and family food environments found that full-time employed mothers reported lower family intake of fruits and vegetables compared with part-time employed and unemployed mothers. Higher work-life stress among parents was associated with less frequent family meals, more frequent sugar-sweetened beverage and fast food consumption (Bauer, Hearst, Escoto, Berge, & Neumark-Sztainer, 2012).

In a study, mothers reported factors such as cost, time and availability as influencing food choice (Alderson & Ogden, 1999). Steptoe et al., (1995) also identified health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity and ethical concern as being important factors for adults when selecting foods.

2.10.1 Socio-demographic factors that influence food choices

It has been suggested in a number of studies that socio-demographic factors such as maternal educational level, ethnicity and employment status can impact food choices (Bauer et al., 2012; Cribb, Jones, Rogers, Ness, & Emmett, 2011; Neumark-sztainer et al., 2012; van Ansem et al., 2014).

Studies on the association between parental educational level and dietary patterns of children show inconsistent findings. A study found that parental educational level was unrelated to children's breakfast consumption (Pearson, Biddle, Gorely, 2009). Another study done by (Neumark-sztainer et al., 2012) found parent educational attainment to be inversely associated with the healthiness of foods served at family meals. However, other studies found a positive association between parental educational level and children's eating habits. A study done in the Netherlands aimed at identifying the association between maternal educational level and children's healthy eating behaviour found that children of mothers with a high educational level consumed more pieces of fruit per day, more grams of vegetables per day and were more likely to have breakfast on a daily basis than children of mothers with a low educational level (van Ansem et al., 2014). Another study in the UK which sought to find the relationship between maternal educational level and child diet, indicated lower maternal educational level was associated with less healthy food choices (Cribb et al., 2011). Despite these inconsistencies, several studies which have examined the relationship between maternal education and diets in infants and children have associated higher maternal educational

status with longer duration of breast-feeding, improved physical growth, higher intakes of micronutrients, fruits and vegetables, and lower intake of soft drinks (Aranceta, Perez-Rodrigo, Ribas, 2003; Rogers, 2003; Vereecken, Maes, 2004; Wachs, Creed-Kanashiro, Cueto, 2005).

Food choices has also been found to differ with ethnicity or race. A study found that sugared drinks were served most often in the homes of African Americans and American Indians, while sugared drinks and fast food were served least often in the homes of Asian Americans (Neumark-sztainer et al., 2012).

Some studies suggest that socio-economic status is a common influence on children's diets. A study that looked at children aged 1.5 years to 4.5 years as part of a National Diet and Nutrition Survey found that children were less likely to eat fruits and vegetables if they were from low social classes and less advantaged households (Scientific Advisory Committee on Nutrition, 2008). This is consistent with the findings of another study which found poorer diets to be more common in 3-year-old children whose mothers reported a higher degree of financial difficulty and were of a lower educational attainment (North, Emmett, 2000). Nelson, Erens, Bates, Church, Boshier (2007) also found that children from lower income families tend to have lower intakes of fruit and vegetables and higher intakes of non-milk extrinsic sugars. Employment status has also been identified as a factor influencing food choice. Employed mothers have been shown to spend less time on meal planning, grocery shopping, cooking, and eating with their children compared to non-employed mothers. Employed mothers have also been found to more frequently purchased prepared foods including fast food and carry-out food, more frequently consume food away from home (Cawley & Liu, 2007).

2.10.2 Socio-cultural factors that influence food choices

Factors such as convenience, cooking skills, high-work life have been associated with food choices (Hartmann, Dohle, & Siegrist, 2013; Hayter et al., 2015; Neumark-sztainer et al., 2012). In a study of UK mothers exploring their routine food choices, convenience was an important factor in food selection (Hayter et al., 2015). Another study in the U.S found food choices to be associated with social factors such as high work–life stress, depressive symptoms, low family functioning low value of family meals, low enjoyment of cooking, low meal planning, high food purchasing barriers and fewer hours in food preparation (Neumark-sztainer et al., 2012). Cooking skill has also been found to be associated with food choice. A study conducted to find the association between cooking skill and the consumption of various groups of food found that cooking skills correlated positively with vegetable food consumption (Hartmann et al., 2013). Steptoe et al., (1995) identified convenience and familiarity as factors influencing food choice. An observation reported by Devine, Jastran, Jabs, Wethington, Farell, & Bisogni (2006) was that some parents selected less healthy food for themselves and for their families not only for the purpose of convenience, but because they were viewed as a treat or reward to make up for a difficult work day and to provide an opportunity for a calm and rewarding family event.

2.10.3 Diet and health related factors that influence food choices

Diet and health related factors such as quality, freshness, taste and healthiness of food have been shown to be important factors in food decision making (Holsten et al., 2012; Neumark-sztainer et al., 2012; Ohly et al., 2012). A study done by Neumark-sztainer et al. (2012), found healthiness of food as a factor that influenced food choice. Another study found taste and health concerns as factors that motivated food choices (Holsten et al., 2012). A study which explored parents' requirements for healthy eating reported that health, taste, freshness and quality were the most

important factors influencing their food choices for their pre-school children (H. R. Ohly et al., 2012). A study which aimed to examine the types of foods mothers feed their children and their motivations for doing so found nutritional value and long-term health implications of foods as the most important factors influencing food choice for their children (Alderson & Ogden, 1999). Steptoe et al. (1995) identified health, natural content, sensory appeal and ethical concern as factors affecting food choice.

In conclusion, malnutrition in children under 5 years remains a public health issue of global and national concern. However, literature on drivers of maternal food choices for children under 5 years is largely scarcely particularly in Africa and Ghana. Notwithstanding, this chapter highlighted important factors that influence mothers in their choice of foods for children under 5 years and feeding practices that can impart malnutrition.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Introduction

This chapter captures detailed descriptions of protocols and processes followed in the conduction of the study. The study site, study design, study population, sampling, data collection, data analysis and ethical issues are described in detail below.

3.2 Study site

The study was conducted in the Akuapim North District of the Eastern Region of Ghana. The Akuapim North District is one of the 26 districts of the Eastern Region. The population of Akwapim North District, according to the 2010 Population and Housing Census, is 136,483 representing 5.2 percent of the Eastern region's total population of 263,3154 (Ghana Statistical Service, 2014). Close to two thirds (63.9%) of the population in the district reside in rural localities (Ghana Statistical Service, 2014).

3.3 Study design

A community based study using both quantitative (survey) and qualitative (focus group discussions) data collection procedures was used for this study.

3.4 Study population

Mothers and their children under 5 years living in the Akuapim North District made up the study subjects.

3.5 Inclusion criteria

All mothers and their children under 5 years living in the Akuapim North District were eligible for the study.

3.6 Exclusion criteria

Children under 5 years living in the Akuapim North District who had any disease condition that could affect nutritional status were excluded from the study. Mothers of such children were also excluded from the study.

3.7 Sampling

A cluster sampling method was used for the study. Sampling was carried out at two levels by cluster and individually within each cluster (Hayter et al., 2015). The Akuapim North district has 8 sub-districts and each sub-district was considered a cluster. Four (4) sub-districts were randomly selected and one (1) community was selected from each selected sub-district purposively to include two urban communities and two rural communities. Mampong, Adukrom, Mangoase and Tinkong sub-districts were selected for the study. The communities selected were Amanokrom from Mampong sub-district, Adukrom from Adukrom sub-district, Mangoase from Mangoase sub-district and Tinkong from the Tinkong sub-district. Ten (10) mothers with children under 5 years of age from the selected sub-districts were recruited for participation in each focus group discussion. Households which were known by community health nurses to have mothers with children under 5 were purposively sampled from the selected communities. Mothers with children under 5 years present in these households were selected for participation. For mothers with more than one child under 5 years, only one child was selected for anthropometric measurements.

3.8 Sample size

In Ghana, only 13% of children age 6-23 months meet the minimum standards set by three core infant and young child feeding (IYCF) practices and only 52% of children younger than 6 months are exclusively breastfed (GSS et al., 2015). Using a prevalence of 52% for exclusive breastfeeding

and 13% for appropriate complementary feeding, a margin of error of 5%, the sample size was calculated using the formula: $N = z^2pq/d^2$

N_1 (calculated sample size using prevalence of exclusive breastfeeding, p = 0.52) = 383.5

N_2 (calculated sample size using prevalence of appropriate complementary feeding, p = 0.13) = 173.8

The larger sample size which is 383.5 was used for the study.

Adjusting for 10% non-response gave a sample size of 422 approximately, 430. Four hundred and fifty-eight (458) mothers with children under 5 years participated in the quantitative study.

For the qualitative study, 3 focus group discussions were conducted in three (3) of the four (4) communities selected for the study. A total of thirty (30) mothers participated in the FGDs.

3.9 Data collection

Quantitative data were collected through interviews using a questionnaire and qualitative data were collected through focus group discussions.

3.9.1 Questionnaire

A face-to-face semi-structured interview was conducted with each of the 458 participants. Questions for the questionnaire were adapted using questions from the food choice questionnaire (Steptoe et al., 1995), MICS 4 children's questionnaire and the GDHS 2015 children's questionnaire. The questionnaire was made up of both open and close ended questions. Questions were asked on demographic characteristics, knowledge and practice of exclusive breastfeeding and appropriate complementary feeding and factors influencing food choices for children.

Demographics

The age, educational level, religion, employment status, monthly income, ethnicity and marital status of mothers were recorded.

Anthropometry measurements

Age, height and weight of children were recorded. Age was recorded in months, height was measured in centimetres (cm) and weight in kilogrammes (kg). A weighing scale was used to measure the weight of children to two decimal places and an infantometer was used to measure the height of children to one decimal place. In measuring weight, the child was put in a weighing pant and gently hanged onto the weighing scale. In measuring height, children younger than 24 months were measured lying down and standing height was measured for older children. The child's legs were straightened and the feet was placed flat against the foot piece. The head was positioned, so the crown touches the headboard.

Factors influencing food choice

Subjects were asked to indicate how important some factors were in choosing foods for their children. They were presented with a number of factors and asked to rate each of them on a three-point scale ranging from "very important" (1) to "not important" (3). The factors were based on those identified in the food choice questionnaire as influencing food choice (Steptoe et al., 1995).

Breastfeeding practices

Mothers were asked to indicate if their children received any items apart from breastmilk during the first 6 months of life by answering "Yes" or "No" to a list of items. These were vitamins, mineral supplements or medicine, plain water, fruit juice or sweetened liquid, O.R.S., milk or infant formula. Knowledge of exclusive breastfeeding was assessed by asking mothers to indicate

how strongly they agree or disagree with a number of statements on exclusive breastfeeding. Responses ranged from "strongly agree" (1) to "strongly disagree" (4)

Complementary feeding practices

Mothers were asked to rate a series of foods for how often they fed their children by indicating the number of feedings per week or per day.

3.9.2 Focus group discussion

Three groups were formed based on the age of children whose mothers were recruited. The first group was made up of mothers with children from age 0 to 6 months. The second group comprised of mothers with children aged above 6 months to 23 months. Mothers with children aged above 23 months to 59 months made up the third group. The discussion was led by the Principal Investigator and it lasted for at most an hour. The focus group discussions were conducted using a written guide. The themes which were explored included: factors that influence maternal food choices for children, knowledge and practice of exclusive breastfeeding, knowledge and practice of appropriate complementary feeding and knowledge and practice of recommended feeding for school-aged children.

The focus group discussions were held in three of the four sub-districts selected for the study with a total of 30 participants. The locations were Mangoase in the Mangoase sub-district, Timber Nkwanta in the Tinkong sub-district and Adukrom in the Adukrom sub-district. All 30 participants were mothers of children under 5 years of age. Two of the FGDs were conducted at health centres and one was conducted at an outreach centre.

3.10 Pre-testing

Pre-testing of the research techniques and tools was done to ensure accuracy of the questions and to reveal any problems that may be encountered. Pre-testing was conducted at the Mampong CHPS

compound during a child welfare clinic before the study was commenced in order to observe protocols used and to allow for modification before actual start of the study.

3.11 Quality Assurance

The following measures were put in place to ensure quality and validity of data findings of the study:

- Community health nurses with the essential background in child health and nutrition were recruited and trained as research assistants for the study. The research assistants were taken through the questionnaire and FGD guide to help them collect accurate data.
- The researcher made regular unannounced visits to the study areas to ensure that accurate data were being collected.
- Data collected were checked to ensure that information gathered was accurate.
- Errors identified during the data collection were discussed with the research assistants and the necessary corrections were made.
- Questionnaires with errors that were not corrected were excluded from the study
- Questionnaires were numbered (eg. 1, 2, 3…) to prevent double entry of data during data analysis.

3.12 Variables

The dependent variables are maternal food choices for children under 5 years and nutritional status of children under 5 years. Maternal food choice was measured using exclusive breastfeeding practices for children 0-5 months, minimum dietary diversity for children aged 6-59 months. The nutritional status of children was assessed using anthropometric measures of weight-for-age (underweight), weight-for-height (wasted), and height-for-age (stunted). These measures were determined using the new World Health Organization (WHO) child growth

reference standards. A child was considered stunted, wasted or underweight if their height-for-age, weight-for-height or weight-for-age z-scores were further than −2 standard deviations from the median of the reference sample.

The independent variables are:

- Socio-demographic factors eg. Age, maternal educational level, employment status of mother, ethnicity and socio-economic status
- Socio-cultural factors eg. Family influence, high working-life, convenience and cooking skills
- Diet and health related factors eg. Taste, smell, freshness and healthiness
- Knowledge and practice of appropriate feeding practices eg. Exclusive breastfeeding practices, appropriate complementary feeding practices.

3.13 Data processing and analysis

Quantitative data

Data from interviews were entered into Microsoft Excel and imported in SPSS. Data were cleaned by running frequencies for all variables to identify errors and missing values. Quantitative data from the interviews were analyzed using IBM SPSS for Windows version 20. Key variables identified in the data set were transformed into either categorical or dichotomous variables. Variables that were categorized included age, religion, educational level, marital status, ethnicity and marital status. Religion was further dichotomized into Christians and non-Christians, marital status into married and unmarried. Knowledge of appropriate feeding practices was categorized in no, low and high knowledge based on scores from three questions on breastfeeding practices. Mothers who scored 0 out of 3 were rated as having “no knowledge”, those who scored 1 out of 3

were rated as having "low knowledge" and those who scored 2 or higher were rated as having "high knowledge".

The nutritional status of children under 5 years was measured using HAZ, WAZ and WHZ calculated with WHO anthroplus software version 3.2.2. HAZ, WAZ and WHZ which are continuous variables were categorized into normal height-for-age, stunted or severely stunted, normal weight-for-height, wasted or severely wasted and normal weight-for-age, underweight or severely underweight. A child whose HAZ was below minus two standard deviations (-2 SD) from the median of the reference population are considered stunted. A child who was below minus three standard deviations (-3 SD) was considered severely stunted. Children whose Z-scores are below -2 SD from the median of the reference population were considered wasted. A child whose weight-for-height was below -3 SD was considered severely wasted. Children whose weight-for-age was below -2 SD from the median of the reference population were classified as underweight. Children whose weight-for-age was below -3 SD from the median were considered severely underweight. HAZ was further dichotomized into all stunting and normal height-for-age, WAZ into all underweight and normal weight-for-age and WHZ into all wasting and normal weight-for-height.

Univariate analysis was used to generate descriptive tabulations for socio-demographic characteristics of respondents, food choices for children under 5 years, mothers' perception of factors influencing food choices, feeding practices, knowledge on breastfeeding and nutritional status.

Bivariate analysis was done to find associations between outcome variables and selected independent variables. The key outcome variables, maternal food choices (exclusive breastfeeding and minimum diet diversity) were independently assessed with socio-demographic characteristics, socio-cultural factors and diet and health related factors that influence food choice. Nutritional

status (stunting, wasting and underweight) were also assess with maternal food choices (exclusive breastfeeding and minimum diet diversity). Pearson chi-square statistics were used to determine explanatory variables that were statistically significant. P-value < 0.05 was used to indicate significance.

Simple and multiple logistic regression modelling produced unadjusted and adjusted association between each of the key outcome variables and independent variables. In the simple logistic regression model, each selected independent variable that was statistically significant based on the bivariate analysis was assessed independently with the outcome variable of interest. Odds ratios with accompanying 95% CI were used to assess the strength of relationships.

A multiple logistic regression model was developed for selected variables that showed significance at $p < 0.05$. Also variables that were previously shown to be associated with a selected outcome variable were also added to each model. Previously reported variables associated with each outcome variable or found to be significant during the bivariate analysis were entered and a full model generated in a single step.

Qualitative data

Tape recorded focus group discussions supported by handwritten field notes were transcribed and analysed manually using the principles of systematic text condensation as described by Malterud (1993). The key themes that emerged from the discussions were sorted into categories. Each theme was reported and elaborated further with illustrative quotes.

3.14 Ethical consideration

Ethical clearance was obtained from the Ghana Health Service Ethical Review Board. Written and verbal informed consent was sought for the collection and use of data from each participant before recruitment. Confidentiality and data security were ensured.

3.14.1 Procedure

The aim of the study was explained to all study participants. Individual written informed consent was sought from each participant before participation in study.

3.14.2 Confidentiality

Participants were assured of confidentiality throughout the study with regards to the information they provided. All information concerning individual participants remained anonymous and confidential. All data collected were protected and secured. Access to data was limited to the Principal Investigator and research supervisor.

3.14.3 Conflict of interest

The Principal Investigator had no conflict of interest in the study. There was no form of compensation for study participants.

3.14.4 Right to refuse

Participants were informed that participating in the study was voluntary and they had the right to decline participation or withdraw from the study.

3.14.5 Potential risks and benefits

Study participants did not directly obtain any benefit from participating in the study. However, information obtained from this study would be relevant in developing and implementing interventions to promote child nutrition. There were minimal risks involved in the study. This

study might have posed some inconveniences to participants in terms of the time spent in answering questions and invasion of privacy. Participants were however not obliged to answer any question they were not comfortable with.

3.14.6 Informed consent

Informed consent for participation in the study was sought from study participants. The study procedure was explained to participants in a language they understood. They were informed of the option to decline participation, withdraw from study or decline answering any question they found uncomfortable. Participants were required to sign or thumbprint the informed consent form to indicate willingness to participate. Assent was sought for participants who were less than 18 years by a family member who was above 18 years.

CHAPTER FOUR

4.0 RESULTS

4.1 Introduction

This chapter deals with key findings of the study in four sub-districts of the Akuapim North district. The results includes background characteristics of respondents, factors associated with maternal food choice, knowledge and practice of breastfeeding and complementary feeding, nutritional status of children under 5 years and associations between nutritional status and food choice.

4.2 Background and socio-demographic characteristics for quantitative data

A total of 458 women with children under 5 years were interviewed for the survey. The mean age of participants was 26.5 years with an age range of 14 years to 44 years. Majority of respondents were within the age group of 25-29 years which made up 33.1% of the total number of respondents. This was followed by the age group of 20-24 (116, 26.0%). Only 8 (1.8%) of respondents were within the age group of 40-44.

Ninety-two percent (92%) of participants were Christians while 7.5% and 0.7% belonged to the Islamic and Traditional religion respectively. Half (50.0%) of the respondents were married. More than half (54.6%) of the respondents had attained basic level of education.

Majority of respondents (284, 62.0%) were employed with the most common occupation being trading (50.3%) followed by Civil or Public service work (24.0%). The most common ethnic group was Akan (60.0%) followed by Ewe (17.0%) and Ga-Adangbe (10.0%). Other ethnic groups included Grusi (3.1%), Guan (5.5%), Mole-Dagbani (2.0%), Gurma (1.5%) and others (0.9%) such as Chamba. Monthly income ranged from less than 10 cedis to above 500 cedis. The majority (34.6%) of respondents were within the range of 50 cedis to 100 cedis.

Table 1: Background and socio-demographic characteristics

Background characteristics	Frequency	Percentage
Age of respondents		
Below 15	2	0.4
15-19	55	12.3
20-24	116	26.0
25-29	148	33.1
30-34	82	18.3
35-39	36	8.1
40-44	8	1.8
Total	447	
Religion		
Christian	418	91.9
Muslim	34	7.5
Traditional	3	0.7
Total	455	100.0
Marital status		
Married	228	50.0
Single	133	29.2
Cohabiting	88	19.3
Divorced	5	1.1
Widowed	2	0.4
Total	456	
Educational level		
None	62	13.5
Basic	250	54.6
Secondary	92	20.1
Tertiary	54	11.8
Total	458	
Employment status		
Employed	284	62.0
Unemployed	174	38.0
Total	458	
Occupation		
Civil/public servant	71	24.0
Housewife	10	3.4
Trader	149	50.3
Farmer	35	11.8
Other	31	10.5
Total	296	
Ethnicity		
Akan	275	60.0
Ga/Adangbe	46	10.0
Ewe	78	17.0
Guan	25	5.5
Mole-Dagbani	9	2.0

Grusi	14	3.1
Gurma	7	1.5
Other	4	0.9
Total	458	
Monthly income		
> 10 cedis	8	2.9
10-50 cedis	69	24.6
>50-100 cedis	97	34.6
>100-500 cedis	50	17.9
> 500 cedis	56	20.0
Total	280	
Age of children		
0-5 months	210	45.9
6-23 months	140	30.6
24-59 months	108	23.6
Total	458	

4.3 Socio-demographic characteristics of FDG participants

All 30 participants were mothers of children under 5 years of age. Participants were between the ages of 16 and 43 years. The ethnic groups participants were from were Akan, Ewe, Ga-Adangbe and Guan. The number of children each mother had ranged from one (1) to seven (7).

4.4 Food choices for children aged 0-5 months

Section 4.4 deals presents data on a sub-sample of mothers with children aged 0-5 months with a sub-sample size of 210.

Table 2 describes responses given to a multiple response question on food choice among this sub-sample of mothers with children aged 0-5 months. Sweetened juice or tea was mentioned 19 times, infant formula was mentioned 34 times, solid or semi-solid food was mentioned 29 times and 141(67.1%) exclusively breastfed their children.

Table 2: Food choices for children aged 0-5 months

Variable	Frequency (n =210)
Food choice	
Sweetened, flavoured water or fruit juice or tea	19
Tinned, powdered or fresh milk or infant formula	34
Solid or semi-solid food	29
Exclusive breastfeeding	141

4.5 Food choices for children aged 6-59 months.

Section 4.5 presents data on a sub-sample of mothers with children aged 6-59 months. This sub-sample was made up 248 mothers. This sub-sample is further split into mothers with children aged 6-23 months and mothers with children aged 24-59 months. This sub-samples were made up of 140 and 108 mothers respectively.

Figure 2 describes food choices among the sub-sample of mothers with children aged 6-23 months from a multiple response question. Among children aged 6-23 months, 61.8% consumed dairy products, 91.9% consumed foods from grains and tubers, 63.2% consumed vitamin A rich fruits and vegetables, 55.1% consumed other fruits and vegetables, 23.5% consumed eggs, 70.6% consumed meat and fish, 52.9% consumed legumes and nuts, 22.3% consumed sweet drinks, 32.4% consumed sugary foods (chocolate, pastries, cakes, biscuits, toffees, etc) and 68.4% consumed foods from at least four food groups.

Figure 2: Food choices for children aged 6-23 months

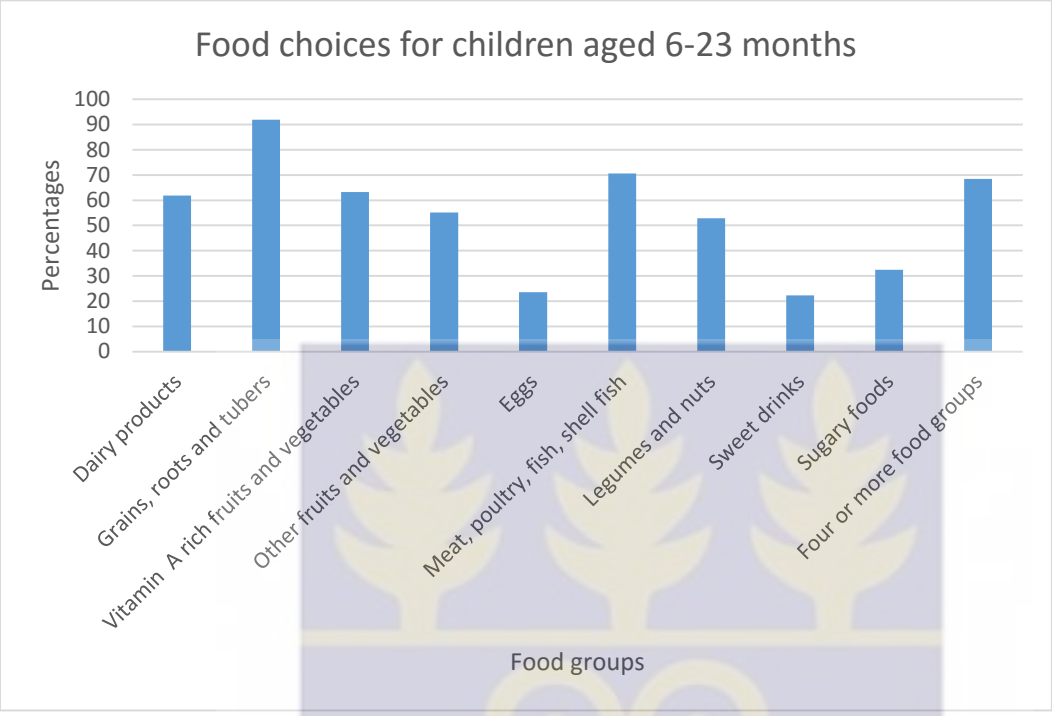
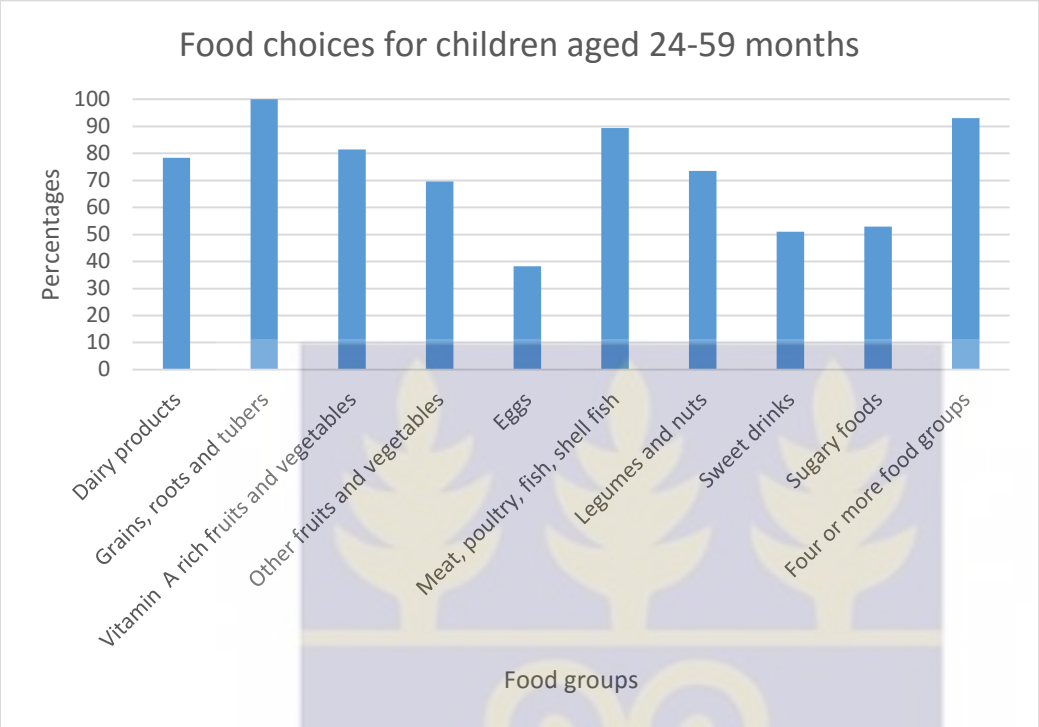


Figure 3 describes food choices among a sub-sample of children aged 24-59 months from a multiple response question. Among children aged 24-59 months, 78.4% consumed dairy products, 100% consumed foods from grains and tubers, 81.4% consumed vitamin A rich fruits and vegetables, 69.6% consumed other fruits and vegetables, 38.2% consumed eggs, 89.4% consumed meat and fish, 73.5% consumed legumes and nuts, 51% consumed sweet drinks, 52.9% consumed sugary foods and 93.1% consumed foods from at least four food groups.

Figure 3 Food choices for children aged 24-59 months



Food groups: a. infant formula, milk other than breast milk, cheese or yogurt or other milk products; b. foods made from grains, roots, and tubers, including porridge and fortified baby food from grains; c. vitamin A-rich fruits and vegetables; d. other fruits and vegetables; e. eggs; f. meat, poultry, fish, and shellfish, and organ meats; g. legumes and nuts.

4.6 Perception of mothers on the factors that influence food choice for children under 5 years

The most common factors influencing maternal food choice for children under 5 years were health and nutritional value (53.1%) and children's preference (24.9%). Other factors included availability (12.9%), variation of foods (3.3%), satisfaction (2.9%) and affordability (1.2%).

Participants of the FGDs gave detailed accounts of the wide range of factors that influenced food choices for their children. Mothers mentioned that their choice of food was based on the child's preference and the nutritional benefit of the food:

It depends on the child….. some children like rice others like banku, so if the child is a little bit old, you can ask him/her what he/she will like to eat and you can prepare it for the child.

I look at the nutrition benefit of the food before giving it.

4.7 Perception of mothers on the socio-demographic factors that influence food choice for children under 5 years

Participants of the FGDs indicated that ethnicity did not determine the kind of food they fed their children:

No, the fact that I'm a Ga does not mean I should give my child kenkey but I rather focus on what the child prefers; as for me I like banku but my child do not like it he likes akple, if you give him banku he will not take it, so it does not matter your staple food, your child may or may not like it.

Most mothers were of the view that income did not influence food choice:

I do not look at my income before deciding on the food I will give to my child, even if you are the poorest in society you can still get nutritious and affordable food like nkontomire, and if you cannot afford meat or chicken you can buy Amani (dry fish) which is less expensive.

Many mothers perceived religion as an unimportant factor in selecting food for children:

….no religion teaches on food to be given to children.

4.8 Associations between practice of exclusive breastfeeding and background characteristics of respondents among children aged 0-5 months

Bivariate analysis in Table 3a, indicated that, there were no associations between exclusive breastfeeding and background characteristics such as age of respondents, religion and marital status, $P > 0.05$. However, the analysis showed an association between exclusive breastfeeding practice and educational level ($P < 0.01$) and employment status ($P < 0.05$). The rate of EBF was

higher in mothers who had attained secondary educational level (86.4%) than mothers who had attained other educational levels. Similarly, employed women (73.3%) had higher EBF rate compared to unemployed women (59.6%).

Table 3a: Associations between exclusive breastfeeding and background characteristics of respondents among children aged 0-5 months

	Exclusive breastfeeding		
	Yes	**No**	**P value**
Variable	**Frequency (%)**	**Frequency (%)**	
Age of respondents			0.098
Below 19	13(48.1)	14(51.9)	
20-24	40(63.5)	23(36.5)	
25-29	44(77.2)	13(22.8)	
30-34	27(67.5)	13(32.5)	
35-44	12(75.0)	4(25.0)	
Religion			0.754
Christian	131(66.5)	66(33.5)	
Non-Christian	9(75.0)	3(25.0)	
Marital status			0.308*
Married	70(70.7)	29(29.3)	
Unmarried	71(64.0)	40(36.0)	
Educational level			0.001
None	23(62.2)	14(37.8)	
Basic	59(56.7)	45(43.3)	
Secondary	38(86.4)	6(13.6)	
Tertiary	21(84.0)	4(16.0)	
Employment status			0.040*
Employed	85(73.3)	31(26.7)	
Unemployed	56(59.6)	38(40.4)	
Ethnicity			0.790
Akan	96(68.1)	45(31.9)	
Ga/ Adangbe	11(64.7)	6(35.6)	
Ewe	18(60.0)	12(40.0)	
Guan	7(63.6)	4(36.4)	
Mole-Dagbani	2(100.0)	0(0.0)	
Grusi	3(60.0)	2(40.0)	
Gurma	2(100.0)	0(0.0)	
Other	2(100.0)	0(0.0)	

Monthly income			0.065
0-50 cedis	16(59.3)	11(40.7)	
>50-100 cedis	28(77.8)	8(22.2)	
>100-500 cedis	15(65.2)	8(34.5)	
> 500 cedis	24(88.9)	3(11.1)	

*- P value from Fishers exact test

4.9 Socio-demographic factors associated with exclusive breastfeeding among children aged 0-5 months.

Outcomes from the simple logistic regression and multiple logistic regression modelling are presented together with their unadjusted and adjusted measures of association. Simple logistic regression analysis was done for all selected background characteristics, while multiple regression analysis was done for only variables that showed significance at $p< 0.05$. Age and monthly income, though not significant, were added based on previous studies which indicated that age and income were determinants of EBF.

From the simple logistic regression analysis, women who had attained basic level of education were 4 times more likely to exclusively breastfeed compared to women in other educational level (OR = 4.004; 95% CI, = 1.284-12.488) and employed women had 1.9 times the odds of exclusively breastfeeding compared to unemployed women OR = 1.861; 95% CI, = 1.040-3.330).

After adjusting for determinants of EBF, data showed that uneducated mothers had 1.4 times the odds of exclusively breastfeeding their children compared to educated mothers (aOR = 1.378; 95% CI, 0.125-15.193)

Table 3b: Socio-demographic factors associated with exclusive breastfeeding among children aged 0-5 months

Variable	Exclusive breastfeeding Unadjusted odds ratio, OR (95% CI)	Adjusted odds ratio, OR (95% CI)
Age of respondents		
Below 19	3.231 (0.829-12.591)	4.983 (0.286-86.673)
20-24	1.725 (0.498-5.975)	1.553 (0.264-9.120)
25-29	0.886 (0.244-3.219)	1.076 (0.186-6.221)
30-34	1.444 (0.389-5.358)	0.810 (0.140-4.679)
35-44	Ref	
Religion		
Christian	0.662 (0.173-2.526)	
Non-Christian	Ref	
Marital status		
Married	1.360 (0.761-2.431)	
Unmarried		
Educational level		
None	3.196 (0.908-11.253)	1.378 (0.125-15.193)
Basic	4.004 (1.284-12.488)	0.974 (0.107-8.862)
Secondary	0.829 (0.210-3.271)	0.364 (0.042-3.189)
Tertiary	Ref	
Employment status		
Employed	1.861 (1.040-3.330)	
Unemployed	Ref	
Monthly income		
0-50 cedis	5.500 (1.323-22.862)	2.893 (0.246-34.062)
>50-100 cedis	2.286 (0.545-9.595)	2.423 (0.227-25.844)
>100-500 cedis	4.267 (0.976-18.657)	4.859 (0.596-39.626)
> 500 cedis	Ref	

Statistical significance was set as $p < 0.05$. Ref – reference.

4.10 Association between diet diversity and background characteristics among children aged 6-59 months.

Bivariate analysis between background characteristics and diet diversity showed no associations. However, the proportion of mothers who met the diet diversity requirement was higher among mothers aged 30-34 (92.9%), non-Christians (84.0%), married women (79.7%), uneducated mothers (88.0%), employed mothers (80.2%) and mothers who earned a monthly income above

500 cedis (89.7%).

Table 4: Association between diet diversity and background characteristics among children aged 6-59 months

Variable	Four or more food groups Yes Frequency (%)	 No Frequency (%)	P value
Age of respondents			0.172
19 and below	24 (80.0)	6 (20.0)	
20-24	39 (73.6)	14 (26.4)	
25-29	69 (76.7)	21 (23.3)	
30-34	39 (92.9)	3 (7.1)	
35-44	21 (75.0)	7 (25.0)	
Religion			0.795*
Christian	173 (78.6)	47 (21.4)	
Non-Christian	21 (84.0)	4 (16.0)	
Marital status			0.756*
Married	102 (79.7)	26 (20.3)	
Unmarried	91 (77.8)	26 (22.2)	
Educational level			0.224
None	22 (88.0)	3 (12.0)	
Basic	110 (75.3)	36 (24.7)	
Secondary	37 (78.7)	10 (21.3)	
Tertiary	3 (10.3)	26 (89.7)	
Employment status			0.506*
Employed	134 (80.2)	33 (19.8)	
Unemployed	61 (76.2)	19 (23.8)	
Ethnicity			0.304
Akan	106(79.1)	28(20.9)	
Ga/ Adangbe	19(65.5)	10(34.5)	
Ewe	38(79.2)	10(20.8)	
Guan	11(84.6)	2(15.4)	
Mole-Dagbani	6(85.7)	1(14.3)	
Grusi	9(100.0)	0(0.0)	
Gurma	5(100.0)	0(0.0)	
Other	1(50.0)	1(50.0)	
Monthly income			0.412
0-50 cedis	39 (78.0)	11 (22.0)	
>50-100 cedis	48 (78.7)	13 (21.3)	
>100-500 cedis	23 (88.5)	3 (11.5)	
> 500 cedis	26 (89.7)	3 (10.3)	

Statistical significance was set as p< 0.05. * - P value from Fishers exact test. Ref – reference

4.11 Perception of mothers on the socio-cultural factors that influence food choice for children under 5years.

From figure 4, majority of mothers perceived family influence (71.4%), food belief (85.3%), staple food preference (61.3%), ease of preparation (63.8%), availability in close shops or markets (59.4%), affordability (56.2%) and value for money (56.7%) as important in choosing foods for their children. However, few mothers perceived usual food eaten at home (48.5%) and childhood favourite (36.3%) to be important factors that influenced food choice for children under 5 years. From the FGDs, mothers were of the view that cooking skills did not limit the range of foods they could choose from for their children:

If I cannot prepare kenkey, I can prepare a nice stew and go buy the kenkey.

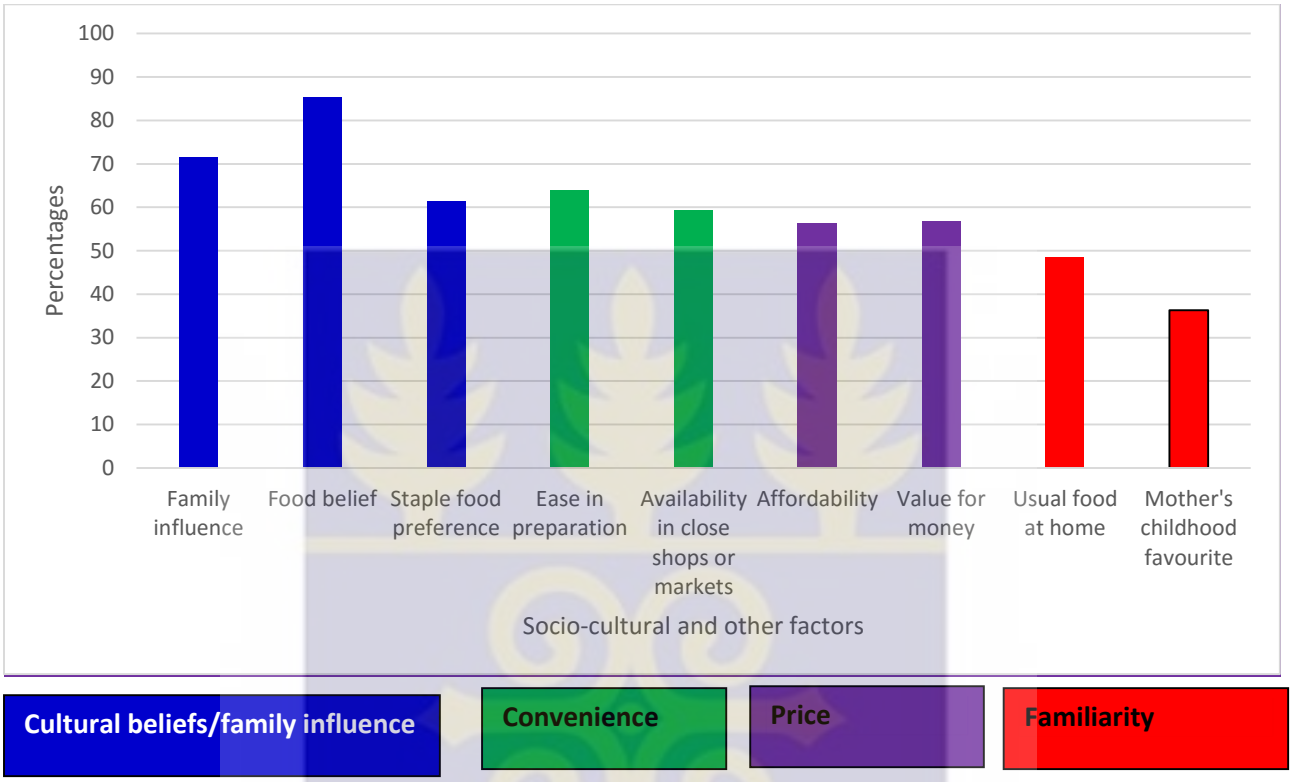
Participants admitted the strong influence parents and in-laws had on the foods they chose for their children:

I remember my niece was advised on exclusive breastfeeding but her mother observed the child and asked her to give koko to the child, in less than a month, the child had bloated stomach with a lot of phlegms in the stool, this tells us that our parents may not always know what is best.

Mothers mentioned an occasional challenge of time constraints in preparing food for children. However, they were of the view that it was necessary to make time to prepare healthy meals for children:

Most children like rice and it is easy to prepare oil-rice but that may not be healthy for your child so you will have to dedicate some time to cook healthy food for your child.

Figure 4: Perception of mothers on the socio-cultural and other factors that influence food choice for children under 5 years.



4.12 Association between exclusive breastfeeding practice and socio-cultural and other factors among children aged 0-5 months.

Table 5 shows the bivariate analysis between socio-cultural factors affecting maternal food choice and exclusive breastfeeding. The analysis showed no associations between exclusive breastfeeding practice and socio-cultural factors. However, EBF rate was higher among mothers who perceived belief that breastmilk was good for children (68.4%) and breastmilk being seen as staple food for babies (67.6%) as factors that motivated them to breastfeed their children.

Table 5: Association between exclusive breastfeeding and socio-cultural factors among children aged 0-5 months

Variable	Exclusive breastfeeding Yes Frequency (%)	No Frequency (%)	P value
Cultural belief and family influence			
Family influence			0.874*
Important	98(66.7)	49(33.3)	
Not important	43(68.3)	20(31.7)	
Food belief to be good for children			0.250*
Important	128(68.4)	59(31.6)	
Not important	13(56.5)	10(43.5)	
Food being a staple food			0.878*
Important	92(67.6)	44(32.4)	
Not important	49(66.2)	69(33.8)	
Convenience			
Ease of preparation			0.878*
Important	88(66.2)	45(33.8)	
Not important	51(68.0)	24(32.0)	
Price			
Affordability			0.769*
Important	78(66.1)	40(33.9)	
Not important	62(68.1)	29(31.9)	
Familiarity			
Childhood favourite			0.292*
Important	51(52.5)	31(37.8)	
Not important	89(70.1)	38(29.9)	

Statistical significance was set as p< 0.05. * - P value from Fishers exact test. Ref – reference

4.13 Association between diet diversity and socio-cultural and other factors among children aged 6-59 months.

Table 6, shows the bivariate analysis of diet diversity and socio-cultural factors. The analysis indicated no associations between diet diversity and ease of food preparation, affordability and familiarity. Diet diversity was however associated with mother's recommendation (P< 0.01), belief to be good for children (P<0.01), staple food preference (P<0.01), availability (P< 0.05) and good value for money (P< 0.05).

Table 6: Association between diet diversity and socio-cultural and other factors among children aged 6-59 months

Variable	Four or more food groups No Frequency (%)	 Yes Frequency (%)	 P value
Cultural belief and family influence			
Mother's recommendation			0.005*
Important	29(16.2)	150(83.8)	
Not Important	23(33.8)	45(66.2)	
Food belief			0.003*
Important	34(16.8)	168(83.2)	
Not important	17(38.6)	27(61.4)	
Staple food			0.002*
Important	20(13.9)	124(86.1)	
Not important	31(30.4)	71(69.6)	
Convenience			
Ease of preparation			0.051*
Important	27(17.1)	131(82.9)	
Not important	25(28.1)	64(71.9)	
Availability in close shops and markets			0.016*
Important	24(15.9)	127(84.1)	
Not important	28(29.2)	68(70.8)	
Price			
Affordability			0.209*
Important	25(18.0)	114(82.0)	

Not important	27(25.0)	81(75.0)	
Good value for money			0.026*
Important	23(15.9)	122(84.1)	
Not important	29(28.4)	73(71.6)	
Familiarity			
Usual food			1.000*
Important	27(20.9)	102(79.1)	
Not important	25(21.4)	92(78.6)	
Childhood favourite			1.000*
Important	17(20.5)	66(79.5)	
Not important	35(21.3)	129(78.7)	

*- P value from Fishers exact test

4.14 Socio- cultural and other factors that influence selection of food from four or more food groups among children aged 6-59 months

Table 7 describes regression analysis between diet diversity and socio-cultural and other factors that influence food choice. Outcomes of the analysis are presented together with their unadjusted and adjusted measures of association. Simple logistic regression was done for all socio-cultural and other factors while multiple logistic regression was done for only variables found to be statistically significant.

At the simple logistic level, mothers who perceived family influence as important in food choice had lower odds of meeting diet diversity requirement compared to those who thought family influence as unimportant (OR = 0.378; 95% CI, 0.199-0.718). Mothers who thought food belief as important for food choice had 0.3 times the odds of meeting the diet diversity requirement compared to those who perceived it as unimportant (OR = 0.321; 95% CI, 0.158-0.654). Mothers who perceive staple food preference as a factor that influence food choice had 0.4 times the odds of feeding their children from at least four food groups compared to mothers who perceived staple food preference as unimportant (OR = 0.587; 95% CI, 0.276-1.247). Mothers who perceived

availability of foods in close shops and markets (OR = 0.459; 95% CI, 0.247-0.853) and value for money (OR = 0.475; 95%CI, 0.255-0.882) as factors that influenced their choice of foods were less likely to meet the diet diversity requirement.

The multiple logistic regression model examined the socio-cultural factors associated with meeting diet diversity requirement after adjusting for a number of covariates. Mothers who perceived family influence (aOR = 0.612; 95% CI, 0.282-1.330), food belief (aOR = 0.538; 95% CI, 0.232-1.250), staple food preference (aOR = 0.587; 95% CI, 0.276-1.247), availability of food in close shops or markets (aOR = 0.856; 95% CI, 0.399-1.835) and value for money (aOR = 0.648; 95% CI, 0.317-1.324) were less likely to feed their children from at least four food groups.

Table 7: Socio-cultural and other factors associated with diet diversity among children aged 6-59 months

Variable	Four or more food groups Unadjusted odds ratio, OR (95% CI)	Adjusted odds ratio, aOR (95% CI)
Cultural belief and family influence		
Family influence		
Important	0.378 (0.199-0.718)	0.612 (0.282-1.330)
Not Important	Ref	
Food belief to be good for children		
Important	0.321 (0.158-0.654)	0.538 (0.232-1.250)
Not important	Ref	
Staple food preference		
Important	0.369 (0.196-0.696)	0.587 (0.276-1.247)
Not important	Ref	
Convenience		
Ease of preparation		
Important	0.528 (0.284-0.982)	
Not important	Ref	
Availability in close shops and markets		
Important	0.459 (0.247-0.853)	0.856 (0.399-1.835)
Not important	Ref	

Price		
Affordability		
Important	0.658 (0.356-1.216)	
Not important	Ref	
Value for money		
Important	0.475 (0.255-0.882)	0.648 (0.317-1.324)
Not important	Ref	
Familiarity		
Usual food eaten at home		
Important	0.974 (0.528-1.798)	
Not important	Ref	
Childhood favourite		
Important	0.949 (0.495-1.820)	
Not important	Ref	

Statistical significance was set as $p < 0.05$. Ref – reference. -2 Log likelihood – 231.999[a], Cox &Snell R Square – 0.075, Nagelkerke R Square – 0.117

4.15 Perception of mothers on the diet and health related factors that influence food choice for children under 5 years

Figure 5 describes the diet and health related factors perceived to be important in influencing food choice by mothers. Most mothers perceived nutritional value (98.5%) and health benefits of food (98.5%) as important factors that influenced food choice. Eighty-nine percent of mothers perceived fibre content to be important in the selection of foods for their children. A number of mothers also perceived smell (70.5%), freshness (80.3%), texture (80.9%), taste (77.9%), absence of additives (74.9%) and absence of artificial ingredients (75%) as important factors that influence food choice for their children under 5 years.

Participants of the FGDs mentioned that they considered the taste of food when selecting food for their children:

If you give the child food that does not taste nice he will not eat, so I focus on the taste

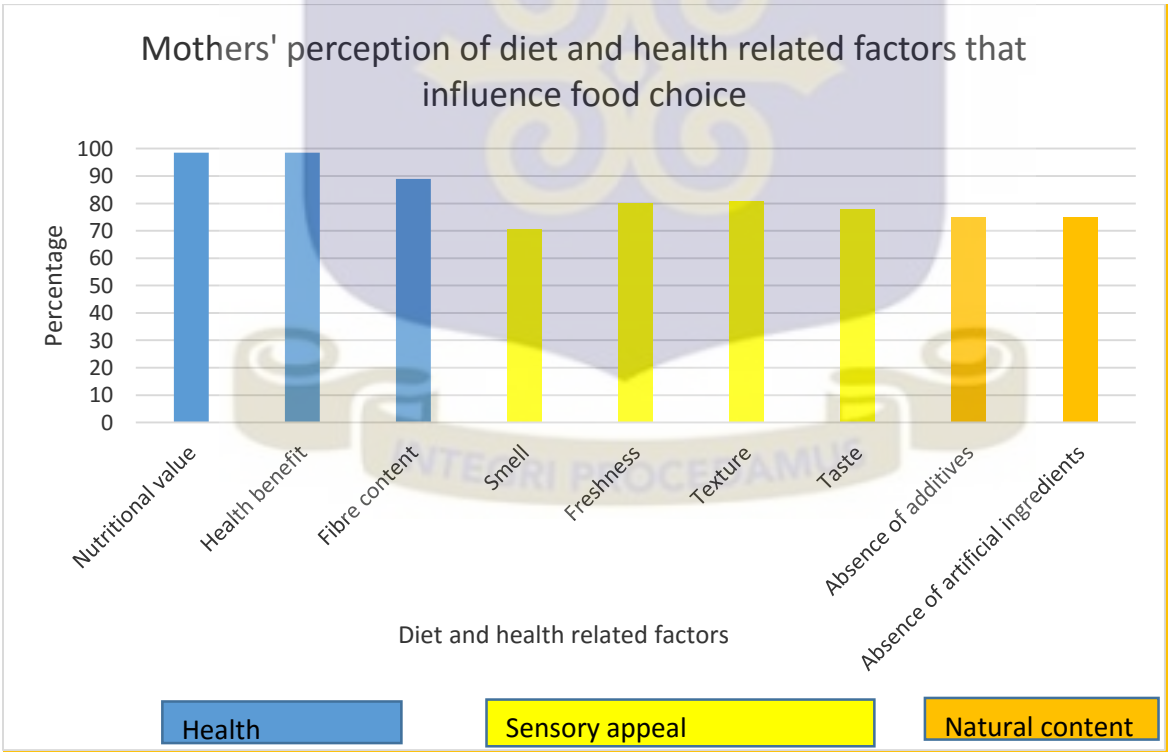
Mothers described how their choice of food for children was influenced by the freshness of the food:

My child does not like left over food he likes fresh and warm food so I consider the freshness.

Participants were of the view that the health benefits and the nutritional value of foods determined the kind of foods they fed their children. One mother mentioned the need to persuade children to eat healthy foods even if that was not their preference:

……even if the child does not like such food you as a mother will have to convince the child to take healthy food.

Figure 5: Perception of mothers on diet and health related factors that influence food choice for children under 5 years.



4.16 Association between exclusive breastfeeding practice and diet and health related factors among children aged 0-5 months.

In table 8, the bivariate analysis indicated that there were no associations between exclusive breastfeeding and diet and health related factors. However, the EBF was higher among mothers who perceived nutritional value (67.6%), health benefit (67.5%), fibre content, absence of additives (69.6%), absence of artificial ingredients (69.6%) smell (67.5%), texture (69.7%) and taste (67.6%) as important factors for food choice for children 0-5 months.

Table 8: Association between diet and health related factors and exclusive breastfeeding among children aged 0-5 months

Variable	Exclusive breastfeeding Yes	No	P value
Health			
Nutritional value			0.252*
Important	140(67.6)	67(32.4)	
Not important	1(33.3)	2(66.7)	
Health benefit			0.200*
Important	141(67.5)	68(32.5)	
Not important	0(0.0)	1(100.0)	
Fibre content			
Important	131(68.6)	60(31.4)	
Not important	10(52.6)	9(47.4)	
Natural content			
Absence of additives			0.281*
Important	96(69.6)	42(30.4)	
Not important	44(62.0)	27(38.0)	
Absence of artificial ingredients			0.281*
Important	96(69.6)	42(30.4)	
Not important	44(62.0)	27(38.0)	
Sensory appeal			
Smell of food			0.875*
Important	96(67.6)	46(32.4)	
Not important	44(65.7)	23(34.3)	
Freshness			1.000*
Important	104(66.7)	52(33.3)	

Not important	36(67.9)	17(32.1)	
Texture			0.188*
Important	102(69.7)	46(30.3)	
Not important	34(59.6)	23(40.4)	
Taste			0.873*
Important	98(67.6)	47(32.4)	
Not important	42(65.6)	22(34.4)	

Statistical significance was set as p< 0.05. * - P value from Fishers exact test. Ref – reference

4.17 Association between diet diversity and diet and health related factors among children aged 6-59 months.

Table 9 shows bivariate analysis of diet diversity and diet and health related factors. Bivariate analysis revealed that associations existed between diet diversity and nutritional value (P< 0.05) and smell (P< 0.01). A greater proportion (78.9%) of mothers who perceived nutritional value as important for food choice fed their children foods from at least 4 food groups. Eighty-four percent of mothers who perceived smell of food as an important factor in food choice fed their children food from at least 4 food groups.

Table 9: Association between diet diversity and diet and health related factors among children aged 6-59 months.

	Four or more food groups		
	No	**Yes**	**P value**
Variable	**Frequency (%)**	**Frequency (%)**	
Health			
Nutritional value			0.030*
Important	49(20.2)	194(79.8)	
Not important	3(75.0)	1(25.0)	
Health benefit			0.110*
Important	49(20.3)	192(79.7)	
Not important	3(50.0)	3(50.0)	
Fibre content			1.000*
Important	46(21.3)	170(78.7)	
Not important	6(19.4)	25(80.6)	
Sensory appeal			
Smell of food			0.003*
Important	29(16.1)	151(83.9)	

Not important	23(34.3)	44(65.7)	
Freshness			0.189*
Important	41(19.5)	169(80.5)	
Not important	11(29.7)	26(70.3)	
Texture			0.344*
Important	48(22.2)	168(77.8)	
Not important	4(13.3)	26(86.7)	
Taste			0.515*
Important	43(20.5)	167(79.5)	
Not important	9(25.0)	27(75.0)	
Natural content			
Absence of additives			1.000*
Important	43(21.4)	158(78.6)	
Not important	9(20.9)	34(79.1)	
Absence of artificial ingredients			0.537*
Important	45(22.2)	158(77.8)	
Not important	7(16.3)	36(83.7)	

*- P value from Fishers exact test

4.18 Diet and health related factors associated with diet diversity among children aged 6-59 months.

Associations between diet diversity and diet and health related factors after simple and multiple logistic regressions are presented in table 10 with their adjusted and unadjusted measures of associations. Results of the simple logistic regression showed that mothers who perceived nutritional value of foods as important in food choice had 0.08 times the odds of choosing foods from four or more food groups for their children (OR = 0.084; 95% CI, 0.009-0.827). Mothers who perceived nice smell of food as an important factor in food choice had 0.4 times the odds of selecting foods from four or more food groups for their children (OR = 0.367; 95% CI, 0.193-0.698).

Table 10: Diet and health related factors associated with diet diversity among children aged 6-59 months.

Variable	Four or more food groups	
	Unadjusted odds ratio, OR (95% CI)	Adjusted odds ratio, aOR (95% CI)
Health		
Nutritional value		
Important	0.084 (0.009-0.827)	0.094 (0.009-0.971)
Not important	Ref	
Health benefits		
Important	0.255 (0.050-1.304)	
Not important	Ref	
Fibre content		
Important	1.127 (0.437-2.911)	
Not important	Ref	
Sensory appeal		
Smell		
Important	0.367 (0.193-0.698)	0.377 (0.197-0.723)
Not important	Ref	
Freshness		
Important	0.573 (0.262-1.255)	
Not important	Ref	
Texture		
Important	1.857 (0.618-5.582)	
Not important	Ref	
Taste		
Important	0.772 (0.338-1.764)	
Not important	Ref	
Natural content		
Absence of additives		
Important	1.028 (0.458-2.307)	
Not important	Ref	
Absence of artificial ingredients		
Important	1.465 (0.611-3.513)	
Not important	Ref	

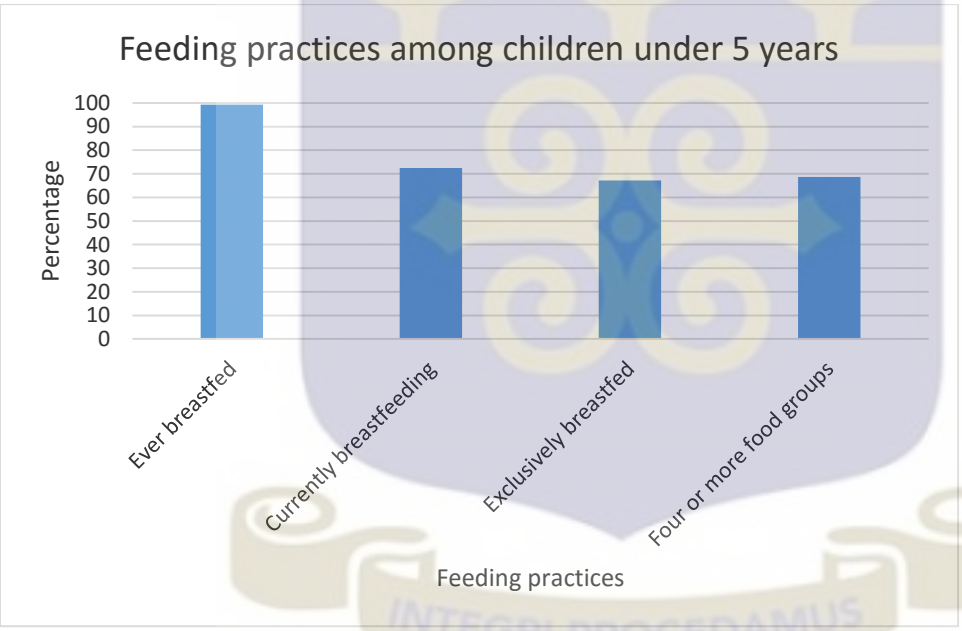
Statistical significance was set as $p < 0.05$. Ref – reference. -2 Log likelihood – 240.423[a], Cox &Snell R Square - 0.054, Nagelkerke R Square – 0.085

4.19 Feeding practices among children under 5 years

Most respondents (71.4%) initiated complementary feeding from six months. Eighty-six percent of children age 6-23 months received breastmilk in addition to solid or semi-solid food.

Figure 6 shows the feeding practices among children under 5 years. Ninety-nine percent of respondents had ever breastfed their children while 72.4% were currently breastfeeding. The exclusive breastfeeding rate was 67.1%. Among children aged 6-23 months, 68% received food from four or more food groups (grains and tubers, legumes and nuts, flesh foods, dairy products, eggs, vitamin A rich fruits and vegetables and other fruits and vegetables).

Figure 6: Feeding practices among children under 5 years



4.19 Knowledge and practice of appropriate feeding practices

From the FGDs, most mothers were knowledgeable about exclusive breastfeeding however, very few practiced it. Mothers who practiced EBF mentioned the benefits of practicing EBF. Participants who did not practise EBF also shared their thoughts on EBF:

Yes I have heard of exclusive breastfeeding. I could not comply because I felt the child might get thirsty but I cannot not tell when he or she needs water so I give little water but not food.

I have heard of it. I did it because we were taught and when I complied I observed my child stayed healthy throughout the first 6 months, I have also observed that children who are exclusively breastfed tend not to like too much food which is good to me.

Complementary feeding was also discussed at length with most mothers expressing fair knowledge about appropriate complementary feeding practices. Mothers were generally knowledgeable about the age to initiate complementary feeding, the recommended duration for breastfeeding and the required feeding times per day. This notwithstanding, most mothers did not practice appropriate complementary feeding.

Mothers mentioned it was appropriate to initiate complementary feeding at 6 months and continue breastfeeding up to 2 years:

It is generally better to stop breastfeeding at 2 years.

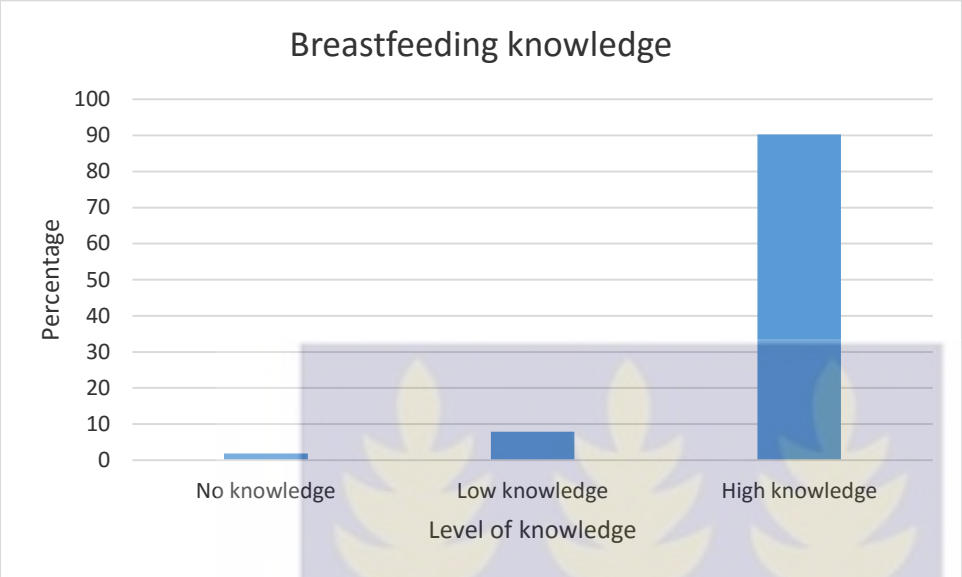
My child was 17 months when I stopped breastfeeding, he was not eating well so I had to stop breastfeeding him.

Mothers also shared their views on the recommended feeding times in a day

.....3 times will be better for children, if you have stop breastfeeding then I think 4 times a day will do otherwise the child will be hungry.

According to figure 7, 90.3% of respondents from the quantitative survey had high knowledge in breastfeeding. Only 1.8% of respondents had no knowledge in breastfeeding.

Figure 7: Breastfeeding knowledge of respondents



4.20 Nutritional status of children under 5 years

Prevalence of stunting and severe stunting were 13.4% and 55.9% respectively. The prevalence of wasting and severe wasting were 4.3% and 4.0% respectively. Prevalence of underweight and severe underweight were 12.4% and 9.2% respectively.

Table 11: Nutritional status of children under 5 years

Variable	Frequency	Percentage
Stunting		
Normal	128	30.7
Stunted	56	13.4
Severely stunted	233	55.9
Total	417	
Wasting		
Normal	343	91.7
Wasted	16	4.3
Severely wasted	15	4.0
Total	374	
Underweight		
Normal	348	78.4
Underweight	55	12.4
Severely underweight	41	9.2
Total	444	

4.21 Association between stunting and food choice

Bivariate analysis between stunting and food choice (EBF and four or more food groups) showed an association between diet diversity and stunting among children aged 6-59 months. Simple logistic regression showed that children who were fed from less than four food groups were 3 times more likely to be stunted compared to children fed from at least four food groups (OR = 3.147; 95% CI, 1.652-5.995).

Table 12: Association between stunting and food choice.

Variable	Any stunting Frequency (%)	Normal height-for-age Frequency (%)	P value	Unadjusted odds ratio, OR (95% CI)
Breastfeeding status			0.311*	
Exclusively breastfed	77 (642)	43 (35.8)		1.466 (0.738-2.911)
Not exclusively breastfed	42 (72.4)	16 (27.6)		Ref
Diet diversity			0.001*	
Four or more food groups	144 (76.6)	44 (23.4)		Ref
Less than four food groups	26 (49.0)	25 (51.0)		3.147 (1.652-5.995)

*- P value from Fishers exact test

4.22 Association between wasting and food choice

Bivariate analysis between wasting and food choice showed no associations. However, the prevalence was higher among exclusively breastfed children (10.4%) and children fed from less than four food groups (9.6%).

Table 13: Association between wasting and food choice

Variable	Any wasting Frequency (%)	Normal weight-for-height Frequency (%)	P value	Unadjusted odds ratio, OR (95% CI)
Breastfeeding status			0.389*	
Exclusively breastfed	11 (10.4)	95 (89.6)		0.518 (0.138-1.943)
Not exclusively breastfed	3 (5.7)	50 (94.3)		
Diet diversity			0.566*	
Four or more food groups	12 (7.4)	151 (92.6)		
Less than four food groups	5 (9.6)	47 (90.4)		0.747 (0.250-2.229)

*- P value from Fishers exact test

4.23 Association between underweight and food choice

Bivariate analysis between underweight and food choice showed no associations. However, prevalence was higher among children who were not exclusively breastfed (23.5%) and children fed from four or more food groups (24.1%).

Table 14: Associations between underweight and food choice.

Variable	Any underweight Frequency (%)	Normal weight-for-age Frequency (%)	P value	Unadjusted odds ratio, OR (95% CI)
Breastfeeding status			0.582*	
Exclusively breastfed	26 (19.4)	108 (80.6)		1.278 (0.631-2.587)
Not exclusively breastfed	16 (23.5)	52 (76.5)		
Diet diversity			0.257*	
Four or more food groups	46 (24.1)	145 (75.9)		
Less than four food groups	8 (15.7)	43 (84.3)		1.705 (0.748-3.888)

*- P value from Fishers exact test

CHAPTER FIVE

5.0 DISCUSSION

5.1 Introduction

This chapter discusses the findings of this study under the following areas: factors associated with maternal food choice, knowledge and practice of appropriate feeding practices and nutritional status of children under 5 years.

5.2 Food choices for children under 5 years

The study used the IYCF practices to define appropriate food choices for children under 5 years. Appropriate IYCF practices include breastfeeding through age 2, introduction of solid and semi-solid foods at age 6 months, and gradual increases in the amount of food given and frequency of feeding as the child gets older. UNICEF and WHO recommend that children be exclusively breastfed during the first six months of life and that they be given age-appropriate solid or semi-solid complementary food in addition to continued breastfeeding from age 6 months to at least age 24 months (WHO, 2003).

In addition, children 6-23 months need animal-source foods and vitamin A-rich fruits and vegetables. Four food groups are considered the minimum number appropriate for non-breastfed young children (WHO, 2003). Hence, in this study, appropriate food choice was defined by exclusive breastfeeding among children below 6 months and feeding from at least four food groups for children aged 6-59 months.

The results from this study showed that food consumed by children aged 6-23 months were largely grains and tubers (91.9%) and comparatively low in meat and fish (70.6%), vitamin A rich fruits and vegetables (63.2%), dairy products (61.8%), other fruits and vegetables (55.1%) and eggs (23.5%). This finding is consistent with findings from a study done in Ghana which reported that

diets of children aged 6-23 months were typically from grains, roots and tubers (95%) but rather low in animal source foods (62%), vitamin A rich foods (48%) and fruits and vegetables (20%) (Bentil, Steiner-Asiedu, Lartey, 2016). Previous studies have also shown that typical complementary foods in developing countries are mainly plant-based and include little or no iron-rich animal-source foods (IMCF, 2013; IYCN, 2011; Mensah, Tomkins, 2003).

A study that examined the diet patterns of pre-school age children found that among children aged 24–59 months, only 40.6 percent had met "minimum dietary diversity" (had adequate dietary diversity with ≥ 4 food groups). The most frequent food types given to these children were cereals, roots, or tubers followed by vitamin A rich fruits and vegetables, and other fruits or vegetables (*Timor-Leste Food and Nutrition Survey 2013: Summary of Key Findings and Recommendations*, 2015). In this study, 91.3% of children aged 24-59 months met the minimum dietary diversity requirement. The proportion of children who met the minimum dietary diversity requirement was high in this study and this could be attributed to the abundance of vitamin A rich food particularly mangoes and nkontonmire during the study period. Similar to this study, 70% of 2 and 3-year-olds consumed vegetables as a distinct food item at least once in a day while almost 73% of them consumed fruit as a distinct food item at least once in a day in a study by Fox et al., (2010). In this study, 81% and 70% consumed vitamin A rich fruits and vegetables and other fruits and vegetables respectively. A notable finding in this study was the low level of egg consumption among children 6-23 months (23.5%) and 24-59 months (38.2%). This finding is similar to that reported by Issaka et al. (2015) among children aged 6-23 months (24.2%). An explanation to this is a common food taboo on the consumption of eggs by children. Myths about egg consumption by children include children becoming thieves when they grow and bad smell of the child's stools.

5.3. Factors associated with maternal food choice for children under 5 years.

Good nutrition in the early years of life is essential for children growth and development and as such, a public health issue. No study has explored the factors that influence mothers in the selection of foods for their children in the Akuapim North District. The aim of this study was to identify factors that influence maternal food choices for children under 5 years. Results of this study highlighted that multiple factors motivate mothers in their choice of foods for children. Mothers provided detailed accounts of how important socio-demographic, socio-cultural and diet and health related factors were in influencing their decisions on food choice in the FGDs and rated the importance of each factor in the questionnaire interviews. The most important factors according to respondents, which influenced food choice for their children were health and nutritional value and child's preference. Other factors perceived by mothers to influence food choice included availability, variety in food, satisfaction and affordability. Previous studies have shown a range of factors that influence food choice for children including availability of food at home, cost of food, family influence, limited cooking skills, time and effort of food preparation, hunger and health concerns (Ohly et al., 2012 and Holsten et al., 2012). The finding of this study is in line with earlier work done which reported that while it is women who tend to make the daily food decisions for the family, these decisions are situated within the broader family context, and are shaped by the preferences of their partners and children (Charles and Kerr 1988). Detailed discussion follows below.

5.3.1 Socio-demographic factors that influence food choice for children under 5 years.

Mothers perceived socio-demographic factors such as ethnicity, religion and income as unimportant in the selection of foods for their children. Previous studies suggest that maternal employment level, ethnicity and employment status can impact food choice (Bauer et al., 2012;

Cribb et al., 2011; Neumark-sztainer et al., 2012; van Ansem et al., 2014). An objective of this study was to find socio-demographic factors that were associated with maternal food choice. Among mothers with children aged 0-5 months, the study found associations between exclusive breastfeeding practice and educational level (P< 0.01) and employment status (P< 0.05). The rate of EBF was higher in mothers who had attained secondary educational level (86.4%) compared to mothers who had attained other educational levels. Similarly, employed women (73.3%) had higher EBF rate compared to unemployed women (59.6%). Findings are in line with the results of a study done in Nigeria to identify the determinants of sub-optimal breastfeeding practices which found that educated mothers were more likely to exclusively breastfed their babies (Ogbo, Agho, & Page, 2015). This study found that employed women had 1.9 times the odds of exclusively breastfeeding compared to unemployed women OR = 1.861; 95% CI, = 1.040-3.330). This contrasts findings of another study conducted in Ethiopia which reported employed mothers to be less likely to practice exclusive breastfeeding (Setegn et al., 2012).

5.3.2 Socio-cultural factors that influence food choice for children under 5 years.

From the results of the qualitative study, a key factor perceived by mothers to influence food choice for their children was family influence. This concurs with the findings of a study done by Hayter et al., (2015) which stated that parents were faced with conflicting influences many of which were beyond their control such as the influence of other family members. Although participants demonstrated a desire to adopt appropriate feeding practices, the reality was that, their parents and in-laws had a say in the food choices they made for their children. Previous studies have shown factors such as convenience, cooking skills, high-work life have been associated with food choices (Hartmann et al., 2013; Hayter et al., 2015; Neumark-sztainer et al., 2012).

Associations between food choice for children under 5 years and socio-cultural factors were found

in this study. Feeding from at least four food groups was associated with family influence (P< 0.01), belief to be good for children (P<0.01), staple food preference (P<0.01), availability (P< 0.05) and good value for money (P< 0.05).

5.3.3 Diet and health related factors that influence food choice for children under 5 years

A study in the UK reported that parents perceived health, taste, freshness and quality as the most important factors influencing their food choices for their pre-school children. This supports the findings of this study that revealed that mothers perceived taste, freshness and health as important in the selection of food for their children. A study which aimed to examine the types of foods mothers feed their children and their motivations for doing so found nutritional value and long-term health implications of foods as the most important factors influencing food choice for their children (Alderson & Ogden, 1999). Steptoe et al., (1995) also identified health and sensory appeal as factors affecting food choice. This study revealed that associations existed between feeding from at least four food groups and nutritional value (P< 0.05) and smell (P< 0.01).

5. 4 Knowledge and practice of child feeding practices

An objective of the study was to assess knowledge and practice of appropriate breastfeeding and complementary feeding practices. Detailed discussion is below.

5.4.1 Breastfeeding knowledge and practice

Ninety-nine percent (99%) of mothers had ever practiced breastfeeding which is almost similar to the national ever breastfeeding rate of 98% (GSS et al., 2015). This study revealed that 67% of children aged 0-5 months were exclusively breastfed. The GDHS 2015 reported an exclusive breastfeeding rate of 52% among children aged 0-5 months (GSS et al., 2015). According to the Multiple Indictaor Cluster Survey in 2011, only 43% of children aged 0-5 months were exclusively breastfed. The EBF rate from this study is higher compared to rates from the MICS and the GDHS.

This could be due to the fact that most respondents were employed in the informal sector and therefore had enough time to carry on breastfeeding for periods together with an increasing knowledge in appropriate breastfeeding practices. According to a study done in the Akuapim North District, 51.8% of children are exclusively breastfeed for the first six months of life (Anderson et al., 2010). This study indicates an improvement in the EBF rate in the Akuapim North District over the past 6 years.

The EBF rate obtained from this study is similar to findings from a study done in Ethiopia that reported the prevalence of exclusive breastfeeding as 71.3% (Setegn et al., 2012). But the EBF rate found in this study is higher that reported in a study done in Nigeria (31%) (Oche et al., 2011). In this study, 90% of the mothers had high level of breastfeeding knowledge. This is comparable to the study in Accra where 98% of mothers had good knowledge of breastfeeding (Lartey & Aidam, 2005). However, the figure obtained in this study is high when compared to the 55% obtained in the study by Freed and his colleagues (Freed et al., 1995) and 31% observed in a study in Nigeria (Oche et al., 2011).

5.4.2 Complementary feeding practices

Generally, sub-optimal complementary feeding practices have been reported by previous studies in Ghana (Bentil, Steiner-Asiedu, Lartey, 2016; GSS et al., 2015; Issaka et al., 2015). Findings from the Baseline Survey Report in 2011, indicated that only 37.6% of respondents practiced timely complementary feeding; i.e., adding other foods to breastmilk at 6 months. The remaining 62.4% either started earlier or later than 6 months (IYCN, 2011). Another study done in Ethiopia found the prevalence of timely initiation of complementary feeding to be 60.5%. According to the study, 19% of mothers initiated complementary before 6 months (Agumasie Semahegn, Gezahegn Tesfaye, 2014). In this study, most respondents (71.4%) initiated complementary feeding from six

months. Among all children aged 6-23 months, 68% received food from four or more food groups. Eighty-six percent (86%) of children aged 6-23 months received breastmilk in addition to solid or semi-solid food. This finding is consistent with the findings from the GDHS 2015, which revealed that 88% of breastfed children aged 6-23 months received complementary food in addition to breastmilk. However, the proportion of children who met the minimum diet diversity requirement (fed their children from four or more food groups) was much lower (24%) according to the GDHS 2015 report. According to the MICS 2011 report, 47% of children aged 6-23 months were fed from four or more food groups. A study conducted by Bentil, Steiner-Asiedu, Lartey, (2016) also found the total percentage of infants aged 6-23 months who met the minimum dietary diversity to be low (36%). Forty two percent of children 6–23 months received dietary diverse meals from at least four food groups in a study done in Accra (Gyampoh, Otoo, & Aryeetey, 2014).

5.5 Nutritional status of children under 5 years

The GDHS reports that among children under age 5, 19% are stunted, 5% are wasted, and 11% were underweight (Ghana Statistical Service et al., 2015). According to MICS 4, 13% of children under age five in Ghana are moderately or severely underweight and 3% are classified as severely underweight, 23% are moderately or severely stunted, 7 % are severely stunted, 6% are moderately or severely wasted and 1% are severely wasted. From this study, prevalence of stunting and severe stunting were 13.4% and 55.9% respectively, prevalence of wasting and severe wasting were 4.3% and 4.0% respectively and prevalence of underweight and severe underweight were 12.4% and 9.2% respectively. A study done in the Akuapim North District reported a prevalence of 6.2%, 11.4% and 7.3% for wasting, stunting and underweight respectively among children under 5 years (Anderson et al., 2010).

5.5.1 Associations between nutritional status and food choice

Previous studies have shown dietary diversity to be a strong predictor of nutritional status. A survey examining WHO infant and young child feeding indicators in low-income countries showed that eating foods with dietary diversity reduced the risk of stunting (Bhutta et al., 2013). This is consistent with findings of this study. Dietary diversity was associated with stunting; children who were fed from less than four food groups were 3 times more likely to be stunted compared to children fed from at least four food groups (OR = 3.147; 95% CI, 1.652-5.995). The finding of this study is further supported by a study by Onyango, Koski, & Tucker, (1998) in Kenya which indicated that dietary diversity was strongly and consistently related to nutritional status among children aged 12-36 months. This finding also concurs with another study done in Latin America which showed that feeding practices were strongly and significantly associated with child HAZ especially after 12 months of age (Ruel & Menon, 2002).

5.6 Strengths and limitations of study

This study can be interpreted in light of its strengths and limitations. This study is the first study done to identify drivers of maternal food choices for children under 5 years in Ghana. The use of validated questionnaires and both qualitative and quantitative methods of data collection were also strengths of this study. The study also explored other determinants of feeding practices aside socio-demographic characteristics such as social and cultural factors. However, the 24-hour recall method used to estimate dietary diversity may cause overestimation of the proportion of children who met the dietary diversity requirement. In addition, this study used a cross-sectional study design, making it is difficult to establish causal associations between nutritional status and maternal food choice.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter summarizes and concludes on the findings of the study. In addition, it gives recommendations based on the outcomes of the study.

6.2 Conclusions

Among children aged 0-5 months 67.1% were exclusively breastfed and 78.9 % of children aged 6-59 months were fed from at least four food groups.

The study found educational level and employment status as socio-demographic factors associated with maternal food choice (EBF) for children under 5 years.

This study also found family influence, belief to be good for children, staple food preference, availability and good value for money as socio-cultural factors that influence maternal food choice (feeding from at least four food groups) for children under 5 years.

The study found nutritional value and smell as diet and health related factors associated with maternal food choice (feeding from at least 4 food groups) for children under 5 years.

Ninety percent (90.3%) of mothers with children under 5 years had high knowledge in breastfeeding. Among all children aged 6-23 months, 68% met the minimum diet diversity requirement.

From this study, prevalence of stunting and severe stunting were 13.4% and 55.9% respectively, prevalence of wasting and severe wasting were 4.3% and 4.0% respectively and prevalence of underweight and severe underweight were 12.4% and 9.2% respectively. Diet diversity was associated with stunting; children who were fed from less than four food groups were 3 times more likely to be stunted compared to children fed from at least four food groups (OR = 3.147; 95% CI, 1.652-5.995).

6.3 Recommendations

Based on the findings of this study, already existing interventions, aimed at providing mothers with the necessary knowledge and practical skills to appropriately feed their children should take into consideration the factors that motivate mothers the most in food decision-making. A key finding of the study is the strong influence family members have on maternal food choice. From the study, family influence was associated with not meeting the dietary diversity requirement. It is recommended that education on appropriate feeding practices is targeted towards family members of mothers with children under 5 to equip them with adequate skills and knowledge in appropriate feeding practices. This will enable them provide the needed support to mothers to encourage them adopt appropriate feeding practices for children.

From the study, knowledge in appropriate feeding practices for children under 5 years is high however, practice is relatively low. Mothers mentioned the feeling that child is thirsty and family influence as some reasons for low practice of EBF during the FGDs. Community health personnel need to help mothers to develop effective coping strategies for these challenges, to enable mothers adopt appropriate feeding practices and to make positive changes to their children's diets.

Given that malnutrition has been shown by this study to be a problem among children under 5years in the Akuapim North District, appropriate interventions need to be developed and implemented to address this problem. The study revealed that stunting was associated with food choice. It is therefore recommended that health professionals intensify education of mothers with focus on food choice for children under 5 years through home visits and community outreaches. Also, food demonstrations can be done to equip mothers with cooking skills for healthy and nutritious food options for children under 5 years.

Further qualitative and quantitative community based research should be done to identify other

drivers of maternal food choices for children under 5 years.

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APPENDICES

Appendix 1: Informed Consent Form

Title: Drivers of maternal food choices for children under 5 years

Introduction

My name is Akorfa Afenyo, a student of School of Public Health, University of Ghana. I am conducting a study to identify factors that drive the food choices mothers make for their children and how important these factors are to them. I would like to humbly request your participation in this study.

Study procedure

An interview will be conducted and you would be required to answer a few questions which would take about 30 minutes.

Benefits

You will not directly obtain any benefit from participating in the study. However, information obtained from this study would be very relevant in developing and implementing interventions to promote child nutrition.

Risks/ discomforts

This study might pose some inconveniences to you in terms of the time spent in answering questions and invasion of your privacy. You are however not obliged to answer any question you are not comfortable with.

Voluntariness

Participation in this study is on a voluntary basis. You can decline participation or withdraw from participation if you so desire. However, your participation would be very much appreciated.

Confidentiality

Any information you provide will be handled in strict confidentiality. All forms filled will be highly secured and only members of the research team will be have access to them.

NB: Are there any questions you may wish to ask before consenting to the study,

If yes, ……..…

……..

You can contact the researcher on 020-3667374 or akorfaafenyo@yahoo.com or the Ghana Health Service Ethics Review Committee Administrator (Hannah Frimpong) on 0507041223 to seek further clarification when needed.

I …….. declare that the purpose , procedures, risks and benefits have been explained thoroughly to me. All questions and doubts have been answered and I have understood. I hereby agree to participate.

Signature…… Date…….

I verify that the purpose, procedures, risks and benefits have been explained thoroughly to the participant. All questions and doubts have been answered and the participant has understood. The participant has willingly agreed to take part in the study.

Investigator

Signature……. Date…….

VOLUNTEER AGREEMENT

The document above describing the benefits, risks and procedures for the research title 'DRIVERS OF MATERNAL FOOD CHOICES FOR CHILDREN UNDER 5 YEARS IN THE AKUAPIM NORTH DISTRICT' has been read and explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree to participate as a volunteer.

_____ _____

Date Name and signature or mark of volunteer

If volunteers cannot read the form themselves, a witness must sign here:

I was present while the benefits, risks and procedures were read to the volunteer. All questions were answered and the volunteer has agreed to take part in the research.

…….. ……

Date Name and signature of witness

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to the above individual.

……. ……..

Date Name/ Signature of person who obtained consent

Appendix 2: Questionnaire

SOCIO-DEMOGRAPHIC DATA

Questions	**Coding categories**
1. How old were you as at your last birthday?	…….
2. Religion	□ Christian…….. 1 □ Muslim……. 2 □ Traditional……... 3 □ Others (specify)……... 4
3. Marital status	□ Married…… 1 □ Single……... 2 □ Cohabiting……... 3 □ Divorced…….. 4 □ Widowed……. 5
4. Educational level	□ None…… 1 □ Basic level……... 2 □ Secondary level……... 3 □ Tertiary level……... 4
5. Are you employed?	□ Yes…… 1 □ No……..... 2
6. If **yes**, what is your employment status?	□ Full-time employed…… 1 □ Part-time employed……. 2
7. What work do you do?	□ Civil/ Public servant…… 1 □ Housewife……..... 2

	☐ Trader…….. 3 ☐ Farmer……. 4 ☐ Other (specify)……... 5
8. Ethnicity	☐ Akan……1 ☐ Ga/Adangbe……2 ☐ Ewe…….3 ☐ Guan……...4 ☐ Mole-Dagbani……5 ☐ Grusi……..6 ☐ Gurma……7 ☐ Mande……....8 ☐ Other (specify)……..9
9. Income per month	☐ Less than GHC 10…….. 1 ☐ 10 - GHC 50……... 2 ☐ Above GHC 50 - GHC 100…… 3 ☐ Above GHC 100 - GHC 500…….. 4 ☐ Above GHC 500……. 5

BREASTFEEDING PRACTICES

10. Has your child ever been breastfed?	YES…..1 NO….2 DK…...8 ☐ ☐ ☐
11. Is he/she being still breastfed?	YES…...1 NO….2 DK…...8 ☐ ☐ ☐

12. If **YES**, why have you chosen to breastfeed your child? …… ……..			
13. If **NO**, how old was your child when you stopped breastfeeding? …… (completed months)			
Only for mothers with children aged below 6 months (Que 14 – 18)			
14. Since this time yesterday, did he/she receive any of the following?			
A. Vitamin, mineral supplements or medicine	YES…..1 ☐	NO…..2 ☐	DK…..8 ☐
B. Plain water	YES….1 ☐	NO….2 ☐	DK…..8 ☐
C. Sweetened, flavoured water or fruit juice or tea	YES…..1 ☐	NO…..2 ☐	DK…..8 ☐
D. Oral rehydration solution (ORS)	YES…..1 ☐	NO…..2 ☐	DK…..8 ☐
E. Tinned, powdered or fresh milk or infant formula	YES…..1 ☐	NO…..2 ☐	DK…..8 ☐
F. Any other liquids (specify: _____)	YES…..1 ☐	NO…..2 ☐	DK…..8 ☐
G. Solid or semi-solid (mushy) food	YES…...1 ☐	NO….2 ☐	DK…..8 ☐
H. Received ONLY breast milk	YES…..1 ☐	NO…..2 ☐	DK…..8 ☐
15. In the **<u>past 7 days</u>**, has he/she received any of the following?			
A. Vitamin, mineral supplements or medicine	YES…..1 ☐	NO…..2 ☐	DK…..8 ☐
B. Plain water	YES….1 ☐	NO….2 ☐	DK…..8 ☐
C. Sweetened, flavoured water or fruit juice or tea	YES…..1 ☐	NO…..2 ☐	DK…..8 ☐

D. Oral rehydration solution (ORS)	YES…..1 NO…..2 DK…..8 ☐ ☐ ☐
E. Tinned, powdered or fresh milk or infant formula	YES…..1 NO…..2 DK…..8 ☐ ☐ ☐
G. Solid or semi-solid (mushy) food	YES…...1 NO….2 DK…..8 ☐ ☐ ☐
H. Received ONLY breast milk	YES…..1 NO…..2 DK…..8 ☐ ☐ ☐
16. In the **past two weeks**, did he/she receive any of the following?	
A. Vitamin, mineral supplements or medicine	YES…..1 NO…..2 DK…..8 ☐ ☐ ☐
B. Plain water	YES….1 NO….2 DK…..8 ☐ ☐ ☐
C. Sweetened, flavoured water or fruit juice or tea	YES…..1 NO…..2 DK…..8 ☐ ☐ ☐
D. Oral rehydration solution (ORS)	YES…..1 NO…..2 DK…..8 ☐ ☐ ☐
E. Tinned, powdered or fresh milk or infant formula	YES…..1 NO…..2 DK…..8 ☐ ☐ ☐
G. Solid or semi-solid (mushy) food	YES…...1 NO….2 DK…..8 ☐ ☐ ☐
H. Received ONLY breast milk	YES…..1 NO…..2 DK…..8 ☐ ☐ ☐
17. In the past **one month**, has he/she received any of the following?	
A. Vitamin, mineral supplements or medicine	YES…..1 NO…..2 DK…..8 ☐ ☐ ☐
B. Plain water	YES….1 NO….2 DK…..8 ☐ ☐ ☐
C. Sweetened, flavoured water or fruit juice or tea	YES…..1 NO…..2 DK…..8 ☐ ☐ ☐

D. Oral rehydration solution (ORS)	YES…..1 NO…..2 DK…..8 ☐ ☐ ☐
E. Tinned, powdered or fresh milk or infant formula	YES…..1 NO…..2 DK…..8 ☐ ☐ ☐
G. Solid or semi-solid (mushy) food	YES…...1 NO….2 DK…..8 ☐ ☐ ☐
H. Received ONLY breast milk	YES…..1 NO…..2 DK…..8 ☐ ☐ ☐
18. Has your child **ever** received any of the following?	
A. Vitamin, mineral supplements or medicine	YES…..1 NO…..2 DK…..8 ☐ ☐ ☐
B. Plain water	YES….1 NO….2 DK…..8 ☐ ☐ ☐
C. Sweetened, flavoured water or fruit juice or tea	YES…..1 NO…..2 DK…..8 ☐ ☐ ☐
D. Oral rehydration solution (ORS)	YES…..1 NO…..2 DK…..8 ☐ ☐ ☐
E. Tinned, powdered or fresh milk or infant formula	YES…..1 NO…..2 DK…..8 ☐ ☐ ☐
G. Solid or semi-solid (mushy) food	YES…...1 NO….2 DK…..8 ☐ ☐ ☐

DIET DIVERSITY- *for mothers with children aged 6-59 months (Que 19 - 23)*

19. In the past 24 hours, did you feed your baby with any of the foods listed below; even if it was combined with other foods? If your baby was fed the food once a day or more, write the number of feedings per day in the last column.

FOODS	YES	NO	DK	FEEDINGS PER DAY
Coding categories	1	2	8	
A. Milk: cow milk, soy milk, rice milk, goat milk, etc.				
B. Other dairy foods: yogurt, cheese, ice cream, pudding, etc.				
C. Legumes: beans, soya beans, etc.				
D. Sweet drinks: juice drinks, soft drinks, soda, etc.				
E. Baby cereal: porridge, tom brown, cerelac, etc.				
F. Other cereals: breads, rice, banku, kenkey, akple, etc.				
G. Fruits and vegetables: carrots, dark green leafy vegetables (nkontonmire, ayoyo, cassava leaves), mangoes, pawpaw				
H. Other fruits and vegetables: banana, pear, apples, tomatoes, orange				
I. Roots and tubers: yam, potato, cassava, fufu, cocoyam				
J. Meat or chicken				
K. Fish or shellfish				
L. Groundnut paste, other groundnut foods, or nuts				
M. Eggs				
N. Any sugary foods: chocolate, pastries, toffees, cakes, biscuits				
O. Any other food (specify)----------				

20. At what age did you introduce your child to solid/ semi-solid food?.....(completed months)

21. On a typical day, what influences your choice of food for your child?

.....

.....

22. How many times was your child fed with solid or semi-solid food since this time yesterday, during the day or night? …….

23. What is your reason for feeding your baby for the number of times indicated above?

……

……

FACTORS INFLUENCING FOOD CHOICES *(for all mothers)*

Please indicate which factors influence your choice of food for your child and rate its importance

It is important to me that the food I choose for my child on a typical day:	Very Important	Important	Not Important
Coding categories	1	2	3
Factor 1 —Health			
24. Contains a lot of nutrients	☐	☐	☐
25. Keeps my child healthy	☐	☐	☐
26. Is high in fibre and roughage (food that gives free bowels)	☐	☐	☐
Factor 2 —Cultural belief and family influence			
27. It is what my mother recommends	☐	☐	☐
28. It is believed to be good for children	☐	☐	☐
29. That is our staple food	☐	☐	☐

Factor 3 —Convenience			
30. Is easy to prepare	☐	☐	☐
31. Is easily available in shops and markets close to me	☐	☐	☐
Factor 4—Sensory Appeal			
32. Smells nice	☐	☐	☐
33. Looks fresh	☐	☐	☐
34. Has a pleasant texture	☐	☐	☐
35. Tastes good	☐	☐	☐
Factor 5—Natural Content			
36. Contains no additives eg. preservatives and colour	☐	☐	☐
37. Contains no artificial ingredients	☐	☐	☐
Factor 6 —Price			
38. Is not expensive	☐	☐	☐
39. Is good value for money	☐	☐	☐
Factor 7- Familiarity			
40. Is what I usually eat	☐	☐	☐
41. Is like the food I ate when I was a child	☐	☐	☐
Factor 8 – Media			
42. Is advertised on Radio and Television shows	☐	☐	☐
43. Is endorsed by my favourite celebrities	☐	☐	☐
44. Is in movies	☐	☐	☐

How strongly do you agree or disagree with the following statements? ***(for all mothers)***

	Strongly agree	**Agree**	**Disagree**	**Strongly disagree**
Coding categories	**1**	**2**	**3**	**4**
45. Infant formula is as good as breast milk	☐	☐	☐	☐
46. If a baby is breastfed he or she will be less likely to get diarrhea	☐	☐	☐	☐
47. Babies should be exclusively breastfed (fed only breast milk) for the first 6 months	☐	☐	☐	☐
48. If a child was breastfed, he or she will be less likely to become obese	☐	☐	☐	☐

ANTHROPOMETRY MEASUREMENTS

49. Age (completed months)	
50. Height (cm) to one(1) decimal place	
51. Weight (kg) to two(2) decimal places	

Appendix 3: Focus group discussion guide

A. Introduction

- Greetings and thank you for coming. This focus group is to assist us in understanding the factors that influence our choice of foods for our children. In addition, this discussion would help determine our knowledge and practice of exclusive breastfeeding, appropriate complementary feeding and recommended feeding for school-aged children.

- This study is being conducted by Akorfa Afenyo, a student of the School of Public Health, University of Ghana. Your participation is very important because it will help in developing programmes to improve the nutritional status of children. There are no right or wrong answers to any of the questions. Feel free to express your ideas, opinions, or experiences.

- As you may have noticed, there is a tape recorder in the middle of the table. We hope that having a tape recorder will not make you feel uncomfortable. We want to make sure we capture all your ideas and that we do not miss any of the valuable information the group may offer. The tape recorder ensures this. There will also be a recorder who will be writing your response on the flip chart to make sure that we capture what you are saying correctly.

- Please be assured that your individual comments here today are confidential in the sense that we will not identify, by name, anyone's statements. We would like you to sign an informed consent form to ensure your confidentiality and to affirm your voluntary participation in this discussion.

- Let's go through the informed consent form. [*Pass out informed consent form to participants and go over entire form*.]. Before we begin, does anyone have any questions or comments?

Background data for each participant

Date:

Time:

Location:

Moderator:

Respondent Demographic Information

Initials of respondents	**Age**	**Ethnicity**	**Native language**	**Nationality**	**Number of children in your household**
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					

9.					
10.					

B. Factors influencing food choice for children

1. What foods do you usually feed your children with?
2. What factors do you consider when choosing foods for your children?

C. Socio-demographic factors

1. Does where you come from determine the kind of food you feed your child?
    a. *How does your ethinicity affect food choice for your children?*
2. Do you think the amount of money you earn affects the food you feed your children?
3. Do you think your religion affects the food you feed your children?

D. Socio-cultural factors

1. How important is your cooking skill in selecting food for your children?
2. Do your husbands, parents or in-laws influence the foods you choose to feed your children?
3. Do you consider convenience eg. How easy it is to prepare a particular food in deciding what to feed your children?

[*If respondent(s) responded yes, then ask, for how important convenience is in food choice and WHY?*]

E. Diet and health related factors

1. Is food taste important to you when selecting food your children?

   a. *If yes, why is it important?*

2. How important is freshness of food to you when choosing food for your children?

3. Do you consider the health benefits and nutritional value of food when selecting food for your children?

   a. *If yes, why?*

F. Knowledge and practice of exclusive breastfeeding

1. What is exclusive breastfeeding?

2. Are you practicing or did you practice exclusive breasfeeding?

   a. if yes, why

   b. if no, why not

3. At what age did you stop breastfeeding your children and why?

4. How long do you breastfeed your babies before introducing them to semi-solid or solid food?

5. What are the benefits of exclusive breastfeeding?

G. Knowledge and practice of appropriate complementary feeding

1. What foods do you usually feed your babies who are above 6 months?

2. At what age do you introduce them to solid or semi-solid food?

3. How often do you feed them in a day and why?

H. Knowledge and practice of recommended feeding for children aged 24-59 months?

1. What foods do you usually feed your children with?
2. What foods are important for the growth and development of children?
3. What foods give your children energy?
4. What is a balanced diet?

I. Closing

- We are now finished with the discussion. Before we leave, does anyone have other responses or comments about the information discussed today?
- Are there any other nutrition related issues you would like to add?
- Once again, I want to reassure you that everything you said here is today is strictly confidential and anonymous. Your names will not be connected to the information given today. You have been very helpful to us.

Thank you.